

# Lower Yakima Valley Groundwater Management Program

Volume III  
Accomplishments  
June 20, 2019



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# Accomplishments

## **Preliminary Assessment**

Ecology (Washington State Department of Ecology). (2010). Lower Yakima Valley Groundwater Quality: Preliminary Assessment and Recommendations Document. Ecology Publication 10-10-009. Prepared by Washington State Department of Ecology, Washington State Department of Agriculture, Washington State Department of Health, Yakima County Public Works Department, and U.S. Environmental Protection Agency.

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/preliminary-assessment.pdf>

## **Request for Identification**

PGG (Pacific Groundwater Group). (2011). Request for Identification: Lower Yakima Valley Groundwater Management Area. Prepared for Yakima County, Yakima, Washington, by Pacific Groundwater Group, Seattle.

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/request-for-identification.pdf>

## **Groundwater Management Area Advisory Committee Operating Guidelines**

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/gvac-operating-guidelines.pdf>

## **Workplan**

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/gvac-workplan.pdf>

## **Analysis of existing water quality**

PGG (Pacific Groundwater Group). (2013g). Potential Groundwater Monitoring Stations, Yakima Groundwater Management Area. Prepared for HDR Inc., Yakima County, and Lower Yakima Valley Groundwater Advisory Committee, by Pacific Groundwater Group, Seattle.

<https://fortress.wa.gov/ecy/czshare/wq/groundwater/potential-monitoring-well-locations.pdf>

## **Groundwater Monitoring Plan**

PGG (Pacific Groundwater Group). (2014e). Interim Final Groundwater Monitoring Plan, Lower Yakima Valley GWMA, Initial Characterization. JE 1308. Prepared for Lower Yakima Valley Groundwater Advisory Committee and Yakima County, by Pacific Groundwater Group, Seattle, August 15, 2014.

<https://fortress.wa.gov/ecy/czshare/wq/groundwater/interim-final-gw-monitoring-plan.pdf>

## **Groundwater Monitoring QAPP**

PGG (Pacific Groundwater Group). (2013d). Groundwater Monitoring, Quality Assurance/Quality Control Plan: Lower Yakima Valley GWMA, Initial Characterization. JE 1308. Prepared for Yakima County, Washington, by Pacific Groundwater Group, Seattle, September 16, 2013.

<https://fortress.wa.gov/ecy/czshare/wq/groundwater/groundwater-monitoring-qapp.pdf>

## **Ambient Groundwater Monitoring Network**

PGG (Pacific Groundwater Group). (2016c). Lower Yakima Valley GWMA Proposed Ambient Groundwater Monitoring Network. Prepared for Lower Yakima Valley Groundwater Advisory Committee and Yakima County, by Pacific Groundwater Group, Seattle.

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/ambient-groundwater-monitoring-network.pdf>

## **Yakima Groundwater Management Area Well Installation Report**

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/yakima-gwma-well-installation-report.pdf>

## **Drinking Water Sampling QAPP**

USGS, 2017. Quality Assurance Project Plan, Nitrate in Groundwater of the Yakima River Basin. Tacoma, WA, 44 pgs.

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/drinking-water-sampling-qapp.pdf>

## **Drinking Water Sampling Results**

USGS (U.S. Geological Survey). (2018). Concentrations of Nitrate in Drinking Water in the Lower Yakima River Basin, Groundwater Management Area, Yakima County, Washington, 2017. [By Huffman, R.L.] U.S. Geological Survey Data Series 1084, p. 18.

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/drinking-water-sampling-results.pdf>

## **Deep Soil Sampling QAPP**

PGG (Pacific Groundwater Group). (2014c). Deep Soil Sampling Plan, Lower Yakima Valley Groundwater Management Area. Prepared for Yakima County, by Irrigated Agriculture Working Group.

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/deep-soil-sampling-qapp.pdf>

## **Nitrogen Availability Assessment**

WSDA (Washington State Department of Agriculture). (2018). Estimated Nitrogen Available for Transport in the Lower Yakima Valley Groundwater Management Area: A Study by the Washington State Department of Agriculture and Yakima County. [By Bahr,

G., Beale, P., Drennan, M., Hancock, J., McLain, K., Redifer, V., Martian, M., and Kozma, C.] AGR PUB 103-691.

<https://fortress.wa.gov/ecy/ezshare/wq/groundwater/nitrogen-availability-assessment.pdf>

## Documents Produced by LYVGWMA for Education and Public Outreach

## Section 1: Education and Outreach Documents

In early 2017, the GWAC created a test series of four “What You Can Do” one-page (front/back) English/Spanish flyers. The series had two purposes: the first was to promote the key messages identified by the GWAC (i.e., how to protect private well water, how to maintain a septic system, how to manage small farm waste, and how to promote well safety). The second purpose was to introduce a simple, one-page template that the GWAC could use for other educational outreach topics. The series was posted to the website and almost immediately 22,700 flyers were distributed during a widespread flooding event.

“What You Can Do to Protect Well Water” flyers were deployed in response to local flooding in the GWMA’s unincorporated community of Outlook. Yakima Health District staff went door to door distributing over 100 flyers and nitrate test trips for private well testing in flooded areas. Approximately 22,700 flyers were inserted in the *Sunnyside Daily Sun News* and in the Spanish-language *El Sol* weekly newspaper. GWAC volunteers distributed flyers at the Sunnyside Walmart during the flooding event.

## What you can do to protect well water

LOWER YAKIMA VALLEY



## What you can do to protect well water

Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

### Steps to assure you have safe drinking water

#### *Things to consider if you are a private household well owner:*

**Have your water tested** – at least once a year for nitrates and coliform bacteria. High nitrates can harm pregnant women, newborn babies and the elderly, and high bacteria counts can cause illnesses. More information on Lower Yakima Valley Groundwater Management Area at <http://www.yakimacounty.us/1617/Ground-Water-Management-Area>. A list of certified labs and information on water testing are available online at <http://www.yakimacounty.us/344/Drinking-Water-Testing>.

**Locate all wells** on your property, both active and inactive. Make sure to cap your wells securely with manufactured or welded caps to prevent pollution and objects from entering your well.

**Have your septic pumped** – Neglecting septic system maintenance can result in backed-up sewage, expensive repairs and surface seepage that can pollute your well. A system for a four-person household should be pumped every three years.

**Use less water** – Not only does your septic system function better with less water, pumping more water from your well can pull nearby pollution toward your home.

**Manage fertilizers and chemicals** – Excess fertilizer moves easily through the soil and contributes to high nitrate levels. Spilled chemicals can reach your well water. Recycle household and hazardous wastes at the County collection facility. Never dump these items on your property or pour them down the drain.

**Shield animal waste** – Animal yards and piles of composting manure are sources for nitrates and bacteria. Take steps to prevent runoff and soil seepage.

**Install backflow preventers** – on all your outdoor faucets. Sometimes water can siphon backwards through a hose and down your well. Be very careful when you attach a chemical sprayer to your hose.

Do your part to keep groundwater safe and clean.

#### GROUNDWATER MANAGEMENT AREA



The purpose of the Lower Yakima Valley Groundwater Management Area is to reduce nitrate contamination where concentrations do not meet drinking water standards.

#### GWAC Working Groups

- Data Collection, Characterization, Monitoring
- Education and Public Outreach
- Funding
- Irrigated Agriculture
- Livestock/CAFO
- Regulatory Framework
- Residential, Commercial, Industrial and Municipal

To get involved, call  
(509) 574-2300

More information at:  
[www.yakimacounty.us](http://www.yakimacounty.us)

## Septic Safety: What you can do

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## Septic Safety: What you can do

**Groundwater Management Area (GWMA):**

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

### Failing septic systems can pollute drinking water wells

#### **Check it, fix it, maintain it:**

Bacteria, viruses and other pollutants from the sewage of a failing septic system, may contaminate drinking water wells, groundwater aquifers, lakes, rivers and streams.

A septic system doesn't have to be a problem.

- Get regular inspections and maintenance. Choose a date or time of the year that's easy to remember for the inspection. Mark it on the calendar.
- Regularly pump your system. Typically, once every three years for a four-person household.
- Learn how to keep your system working properly. Be careful what you flush or pour down the drain. No pet waste, medications, grease, or toxic chemicals.
- Watch for clues that your tank is nearing capacity or your system is failing. Got odors? Get someone to check it out right away. Then fix it, if needed.
- Keep trees at least 30 feet from edge of drain field to keep their roots from invading. Never drive over the system.
- Conserve water. Too much can cause solids to escape your tank and plug your drain field.
- Repair or replace your system when it fails or is otherwise inadequate.

#### **Locate your septic tank and drain field:**

- Use your property map or follow discharge pipe from your house. Probe the ground with a rod to determine the location of your septic tank.
- Underground pipes distribute wastewater in a drain field. Wet spots can indicate a failing drain field that needs professional attention.

Do your part to keep groundwater safe and clean.

For more information:

<http://www.ecy.wa.gov/programs/wq/wqguide/septic.html>

<http://www.yakimacounty.us/335/Septic-Systems>

#### GROUNDWATER MANAGEMENT AREA



The purpose of the Lower Yakima Valley Groundwater Management Area is to reduce nitrate contamination where concentrations do not meet drinking water standards.

#### GWAC Working Groups

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## Small Farms: What you can do



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

## Small Farms: What you can do

### Poor manure management can threaten drinking water wells

#### *Collect, cover and compost:*

Livestock manure can be great fertilizer. It may also be a source of water pollution when exposed to the weather. If you keep livestock, even just one or two, you have a special role to play in protecting drinking water, groundwater aquifers, rivers and streams.

#### **What can you do to help?**

- Use downspouts to direct runoff away from manure.
- Pick up manure from farm yards and paddocks at least every three days.
- Store manure under cover in a convenient site that's sheltered from heavy winds.
- When you use a tarp for a cover, secure it well. The tarp should be durable, heavy-weight and large enough to fully cover the pile.
- Work with the local conservation district office to make a plan and learn how to best handle your manure.
- Build a compost system or have an off-site compost facility collect the manure.

Washington's [Dairy Nutrient Management Act](#) requires all licensed dairies to develop and implement [nutrient management plans](#). Large livestock operations must follow confined animal feeding operation (CAFO) regulations to protect water quality.

Good manure management also helps you:

- Prevent parasite re-infestation.
- Keep groundwater clean.
- Build goodwill with your neighbors.
- Support a healthy watershed.

Do your part to keep groundwater safe and clean.

For more information:

[http://www.ecy.wa.gov/washington\\_waters/farms.html](http://www.ecy.wa.gov/washington_waters/farms.html)

#### GROUNDWATER MANAGEMENT AREA



The purpose of the Lower Yakima Valley Groundwater Management Area is to reduce nitrate contamination where concentrations do not meet drinking water standards.

#### GWAC

##### Working Groups

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## Well Safety: What you can do



## Well Safety: What you can do

**Groundwater Management Area (GWMA):**

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

### The dangers of uncapped, abandoned or hand dug wells

#### ***Capping prevents pollution, serious injuries:***

All wells must be securely capped, including those that are not in use, temporarily out of service, or not yet decommissioned, to protect the drinking water and the aquifer from contamination. Proper capping also prevents objects, animals and people from falling into the well.

Common methods of capping wells, include using:

- Manufactured well caps.
- Metal plates welded to the top of the well casing.
- A well-seal/artesian style cap for wells in vaults or located in areas where surface water ponds.

These can be found at pump and water supply stores. Securely attach the cap so that it prevents contamination and unpermitted access to the wells. *Don't use an overturned bucket or loose plate to cover the well casing.*

#### **What to look for when searching for an abandoned well:**

Landowners who don't know the history of wells on their property should look for the following when searching for abandoned wells:

- Pipes sticking out of the ground.
- Old well houses.
- Depressions.
- Concrete vaults, pits or tile.
- Metal plates, or old plywood lying on the ground or over concrete tile or vaults.

Do your part to keep groundwater safe and clean.

For more information:

<http://www.ecy.wa.gov/programs/wr/wells/abandon-wells.html>

<https://fortress.wa.gov/ecy/publications/publications/96br097.pdf>

#### GROUNDWATER MANAGEMENT AREA



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#### GWAC Working Groups

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## Granjas Pequeñas: Lo que puede hacer

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### Granjas pequeñas: Lo que usted puede hacer

Área de Manejo de Aguas Subterráneas (GWMA):

El propósito de GWMA es reducir concentraciones de contaminación de nitratos en aguas subterráneas por debajo de los estándares de agua potable del estado.

## Un mal manejo del estiércol puede amenazar los pozos de agua potable

### *Recoja, cubra y haga composta:*

El estiércol de ganado puede ser un gran fertilizante. También puede ser una fuente de contaminación del agua cuando se expone al clima. Si tiene ganado, incluso solo uno o dos, usted tiene un papel especial que desempeñar en la protección del agua potable, los acuíferos subterráneos, los ríos y arroyos.

### Qué puede hacer para ayudar?

- Use canalones para dirigir el escurrimiento de agua lejos del estiércol.
- Recoja el estiércol de los corrales y potreros por lo menos cada tres días.
- Almacene el estiércol bajo cubierta en un sitio conveniente que esté al abrigo de vientos fuertes.
- Cuando utilice una lona como cubierta, asegúrela bien. La lona debe ser durable, pesada y lo suficientemente grande para cubrir totalmente el montón.
- Trabaje con la oficina local de conservación del distrito para hacer un plan y aprender a manejar mejor su estiércol.
- Construya un sistema de composta o busque una planta de compostaje para que recoja su estiércol.

La Ley de Manejo de Nutrientes de Leche de Washington [Dairy Nutrient Management Act](#) requiere que todas las lecherías con licencia desarrollen e implementen planes de manejo de nutrientes [nutrient management plans](#). Las operaciones mayores de ganado deben seguir las regulaciones de operación de animales confinados (CAFO) para proteger la calidad del agua.

El buen manejo del estiércol también lo ayuda a:

- La prevención de reinfestación de parásitos.
- Mantener el agua subterránea limpia.
- Desarrollar buena voluntad con sus vecinos.
- Apoyar una cuenca acuífera saludable.

Haga su parte para mantener las aguas subterráneas limpias y seguras.

Para más información visite:

[http://www.ecy.wa.gov/washington\\_waters/farms.html](http://www.ecy.wa.gov/washington_waters/farms.html)

### ÁREA DE MANEJO DE AGUAS SUBTERRÁNEAS



El propósito del Área de Manejo de Aguas Subterráneas del Valle Bajo de Yakima es reducir la contaminación de nitratos donde la concentración no cumplen con estándares de Agua potable.

### Grupos de trabajo GWAC

- Recolección de datos, caracterización, monitoreo
- Educación y divulgación al público
- Financiación
- Agricultura de riego
- Ganado/CAFO
- Marco Regulatorio
- Residencial, comercial, industrial y municipal

Para participar, llame al:  
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Para más información visite:  
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## Que puede hacer para proteger el agua de pozo

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### Qué puede hacer para proteger el agua de pozo

Área de Manejo de Aguas Subterráneas (GWMA):

El propósito de GWMA es reducir concentraciones de contaminación de nitratos en aguas subterráneas por debajo de los estándares de agua potable del estado.

## Pasos para asegurar que tenga agua potable

### *Cosas a considerar si tiene una vivienda con pozo privado:*

**Haga pruebas a su agua** – Al menos una vez al año para nitratos y bacterias coliformes. Los altos niveles de nitratos pueden afectar a mujeres embarazadas, a los recién nacidos y a los ancianos, y las altas concentraciones de bacterias pueden causar enfermedades. Más información sobre el Área de Manejo de Aguas Subterráneas del Valle Bajo de Yakima en:

<http://www.yakimacounty.us/1617/Ground-Water-Management-Area>. Una lista de laboratorios certificados e información sobre pruebas de agua está disponible en línea en:

<http://www.yakimacounty.us/344/Drinking-Water-Testing>.

**Localice todos los pozos** en su propiedad, activos e inactivos. Asegúrese de tapar sus pozos de forma segura con tapas prefabricadas o soldadas para evitar que contaminación y objetos caigan a su pozo.

**Haga un bombeo a su fosa séptica** – Descuidar el mantenimiento de su sistema séptico puede resultar en que se regresen las aguas residuales, reparaciones costosas y filtración superficial que puede contaminar su pozo. Un sistema para un hogar de cuatro personas debe bombearse cada tres años.

**Utilice menos agua** – No solo su sistema séptico funciona mejor con menos agua, sino también el bombear más agua de su pozo puede atraer contaminación cercana hacia su hogar.

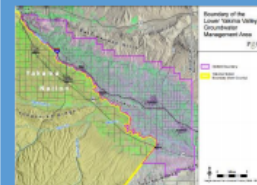
**Maneje los fertilizantes y productos químicos** – El exceso de fertilizante se mueve fácilmente a través del suelo y contribuye a altos niveles de nitrato. Productos químicos derramados pueden alcanzar el agua de su pozo. Recicle los residuos domésticos y peligrosos en los centros de recolección del Condado. Nunca tire estos productos en su propiedad ni los vierta en el drenaje.

**Aísle los residuos animales** – Los corrales de animales y los montones de estiércol son fuentes de nitratos y bacterias. Tome medidas para evitar el escurrimiento y la filtración del suelo.

**Instale válvulas preventivas de reflujo** – en todas sus llaves de agua fuera de la casa. A veces, el agua puede sifonar de regreso a través de una manguera y hacia su pozo. Tenga cuidado cuando conecte rociadores de químicos a su manguera.

Haga su parte para mantener las aguas subterráneas limpias y seguras.

### ÁREA DE MANEJO DE AGUAS SUBTERRÁNEAS



El propósito del Área de Manejo de Aguas Subterráneas del Valle Bajo de Yakima es reducir la contaminación de nitratos donde la concentración no cumplen con estándares de Agua potable.

### Grupos de trabajo GWAC

- Recolección de datos, caracterización, monitoreo
- Educación y divulgación al público
- Financiación
- Agricultura de riego
- Ganado/CAFO
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## Seguridad de sistemas sépticos: Lo que usted puede hacer

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### Seguridad de sistemas sépticos: Lo que usted puede hacer

*Área de Manejo de Aguas Subterráneas (GWMA):  
es reducir concentraciones de contaminación de nitratos en aguas subterráneas por debajo de los estándares de agua potable del estado*

## Los sistemas sépticos que fallan pueden contaminar los pozos de agua potable

### Revíselo, arréglole y dele mantenimiento:

La bacteria, los virus y otros contaminantes de las aguas residuales de un sistema séptico que falla pueden contaminar pozos de agua potable, acuíferos subterráneos, lagos, ríos y arroyos.

Un sistema séptico no tiene que ser un problema.

- Obtenga inspección y mantenimiento regular. Elija una fecha o una época del año que sea fácil de recordar para tener la inspección. Anótelos en su calendario.
- Bombee regularmente su sistema. Normalmente, una vez cada tres años para un hogar de cuatro personas.
- Aprenda a mantener su sistema funcionando correctamente. Tenga cuidado con lo que vierte por el desagüe. No desechos de mascotas, medicamentos, grasas ni químicos tóxicos.
- Esté atento a las señales de que su tanque está cerca de la capacidad o de que su sistema está fallando. ¿Tiene olores? Pídale a alguien que lo revise inmediatamente. Luego, arréglole si es necesario.
- Mantenga los árboles por lo menos a 30 pies del borde del campo de drenaje para evitar que las raíces lo invadan. Nunca conduzca sobre el sistema.
- Conserve agua. Demasiada agua puede causar que los sólidos escapen del tanque y que tapen las líneas del campo de drenaje.
- Repare o reemplace el sistema cuando falle o cuando sea inadecuado.

### Localice el tanque séptico y el campo de drenaje:

- Utilice el plano de su propiedad o siga la línea de descarga de su casa. Pruebe el suelo con una barra para determinar la ubicación del su tanque séptico.
- Las tuberías subterráneas distribuyen las aguas residuales en el campo de drenaje. Las áreas húmedas pueden indicar un campo de drenaje defectuoso que necesita atención profesional.

Haga su parte para mantener las aguas subterráneas limpias y seguras.

Para más información visite:

<http://www.ecy.wa.gov/programs/wq/wgguide/septic.html>

<http://www.yakimacounty.us/335/Septic-Systems>

### ÁREA DE MANEJO DE AGUAS SUBTERRÁNEAS



El propósito del Área de Manejo de Aguas Subterráneas del Valle Bajo de Yakima es reducir la contaminación de nitratos donde la concentración no cumplen con estándares de Agua potable.

### Grupos de trabajo GWAC

- Recolección de datos, caracterización, monitoreo
- Educación y divulgación al público
- Financiación
- Agricultura de riego
- Ganado/CAFO
- Marco Regulatorio
- Residencial, comercial, industrial y municipal

Para participar, llame al:  
(509) 574-2300

Para más información visite:  
[www.yakimacounty.us](http://www.yakimacounty.us)



## Seguridad en pozos: Lo que usted puede hacer

LOWER YAKIMA VALLEY



### Seguridad en pozos: Lo que usted puede hacer

**Área de Manejo de Aguas Subterráneas (GWMA):**  
El propósito de GWMA es reducir concentraciones de contaminación de nitratos en aguas subterráneas por debajo de los estándares de agua potable del estado.

## Los peligros de pozos destapados, abandonados o excavados a mano.

### **Las tapas evitan la contaminación y lesiones graves:**

Todos los pozos deben estar tapados, incluyendo los que no están en uso, temporalmente fuera de servicio o que todavía no están retirados de servicio para proteger el agua potable y el acuífero de la contaminación. Una cubierta adecuada también impide que objetos, animales y personas caigan en el pozo.

Los métodos comunes de tapado de pozos, incluyen el uso de:

- Tapas para pozo prefabricadas.
- Placa de metal soldada a la parte superior del revestimiento del pozo.
- Una tapa de sello para pozo estilo artesiano en bóvedas o localizados en áreas donde el agua superficial se acumula.

Estos pueden encontrarse en tiendas de materiales para irrigación y bombas de agua. Fije la tapa para evitar la contaminación y el acceso no permitido al pozo. No utilice solo un balde volteado o una placa suelta para cubrir el pozo.

### **En qué debe fijarse durante la búsqueda de un pozo abandonado:**

Los propietarios que no saben la historia de los pozos en su propiedad deben fijarse en lo siguiente durante la búsqueda de pozos abandonados:

- Tuberías que salen de la tierra.
- Estructuras y cobertizos para pozos.
- Depresiones en el suelo.
- Bóvedas de hormigón, hoyos, o Azulejo.
- Placas de metal o madera en el suelo o sobre revestimientos o bóvedas de concreto.

Haga su parte para mantener las aguas subterráneas limpias y seguras.

Para más información visite:

<http://www.ecy.wa.gov/programs/wr/wells/abandon-wells.html>  
<https://fortress.wa.gov/ecy/publications/publications/96br097.pdf>

#### ÁREA DE MANEJO DE AGUAS SUBTERRÁNEAS



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## Section 2: Letter to Physicians

The joint Benton County/Yakima Health District letter to physicians launched the GWAC's three-part health risk and public awareness campaign in 2013. Over 200 local healthcare providers received nitrate-related health information as well as a survey asking them if they had observed symptoms of methemoglobinemia in their maternal or infant patients.



## Survey Letter

Dear Medical Provider:

The Lower Yakima Valley Ground Water Management Area Advisory Committee (GWAC) is working to address nitrate contamination and its sources in a wide area where elevated levels of nitrate have been identified in private drinking water wells (see attached map).

This letter is being written in cooperation with the Benton-Franklin and Yakima County Health Districts, which are active members of the advisory committee, and is designed to alert you to the health risks associated with nitrate contamination.

Attached is a handout to provide you with a brief refresher about methemoglobinemia in infants. Symptoms are common and have the potential of being under diagnosed.

At greatest risk are infants younger than six months of age because of the immaturity of their enzyme systems which convert methemoglobin back to hemoglobin.

Maternal exposure to environmental nitrates and nitrites may increase the risk of pregnancy complications such as anemia, abortion, premature labor, or preeclampsia. Study of other potential reproductive, developmental, or carcinogenic effects has not produced conclusive results.

If you are concerned about a patient the appropriate testing should be done to verify your diagnosis. Upon confirmation you should report the condition to the communicable disease section at the Yakima or Benton-Franklin Health Districts depending on your patient's county of residence. Environmental Health personnel at each district should be able to assist you with water quality information, if available, as well as assist the family with sampling of their water as needed.

Yakima County Health District Communicable Disease Report Line: 509-249-6521; for information about water quality, treatment, options, call be Environmental Health help desk at 509-249-6508. Benton-Franklin Health District: 509-460-4200.



We hope you will consider discussing the drinking-water conditions of your patients as you treat them, especially if they reside in the Lower Yakima Valley and exhibit symptoms of methemoglobinemia.

Suspected sources of nitrate contamination are from a variety of land uses, including commercial fertilizers for crop production, animal manures, septic systems and land application of waste water.

More information about the Lower Yakima Valley Ground Water Management Area is available online at: <http://www.yakimacounty.us/gwma/>

Sincerely,

Andre Fresco, Administrator

Amy D. Person, M.D., District Officer

Yakima County Health District

Benton-Franklin Health District

attachments: Methemoglobinemia in infants

YVGWMA Vicinity Map



## Survey Health Care Provider Questionnaire (Attachment)

### Questionnaire for Health Care Providers

Nitrate contamination of drinking water is a growing concern in the United States and around the world. The Lower Yakima Valley has a history of elevated nitrates in groundwater wells that sometimes exceed drinking water standards. In 2011, the Lower Yakima Valley Groundwater Management Area (GWMA) was formed to address nitrate contamination.. The most pressing health issue related to elevated nitrate levels in drinking water is methemoglobinemia in very young children. You can help us gather critical information by completing and returning this questionnaire. We understand that confidentiality prevents sharing of patient information and ask that you provide general information only. Thank you very much for sharing your time and expertise.

1. During the past five years have you cared for infants with signs and symptoms of methemoglobinemia, such as cyanosis in the absence of heart and lung pathology? YES NO

Comments:

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---

2. Are you aware of the relationships between methemoglobinemia and

a. infants (<6 mo.) and well water contaminated with nitrates? YES NO

b. diarrhea in infants? YES NO

c. sepsis in infants? YES NO

3. Do you question about the use of well water when dealing with infants <6 mo. YES NO

4. Do you question about the use of well water when dealing with pregnant women? YES NO

5. Do you encourage families with a newborn to have their well tested for bacteria and nitrates to find out if it's safe before using it to mix formula for their new infant? YES NO

6. How would you like to learn more about nitrate related problems?

ON-LINE \_\_\_\_\_ WORKSHOPS \_\_\_\_\_ WRITTEN SELF STUDY \_\_\_\_\_HEALTH  
DEPARTMENT

MAILING \_\_\_\_\_ OTHER (Please describe) \_\_\_\_\_

7. Please share your thoughts on this subject

---

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(END OF SURVEY)

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If you wish to receive additional information on the Lower Yakima Valley Groundwater Management Area, you may either visit [www.yakimacounty.us/GWMA/](http://www.yakimacounty.us/GWMA/) or provide the following:

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Thank you for participating in this survey.

Please return this survey to: Lower Yakima Valley Groundwater Management Area, c/o Yakima County Public Services, 128 N 2nd St, Fourth Floor, Yakima WA 98901

# **METHEMOGLOBINEMIA**

## **IN INFANTS < 6 MONTHS OF AGE**

### SYMPTOMS/SIGNS:

Bluish discoloration of skin (cyanosis): fails to respond to inhaled O<sub>2</sub>

Fatigue/lethargy

Shortness of breath/tachypnea

Nausea

Diaphoresis

Mental status changes

In severe intoxication (50-70% methemoglobin): shock, seizures, acidosis, death

### DIAGNOSIS:

Methemoglobin level: normal <1%

bluish/chocolate brown blood

Arterial blood gas: usually normal PO<sub>2</sub> in the face of cyanosis

Pulse oximetry: usually inaccurate in the face of methemoglobinemia

O<sub>2</sub> saturation: usually low but inaccurate in the face of methemoglobinemia

### ETIOLOGY:

Nitrates/nitrites in water supply (Sources: fertilizer, manure, damaged well heads, leaking septic systems): EPA recommends <10 ppm

Infants who have diarrhea, sepsis, or other infections may have increased endogenous production of nitrites. Infants already exposed to nitrates in their water source would be at greater risk for methemoglobinemia with these infections.

#### TREATMENT:

1% Methylene blue: 1-2mg/kg IV (beware of risks with G6PD deficiency)

ascorbic acid

oxygen

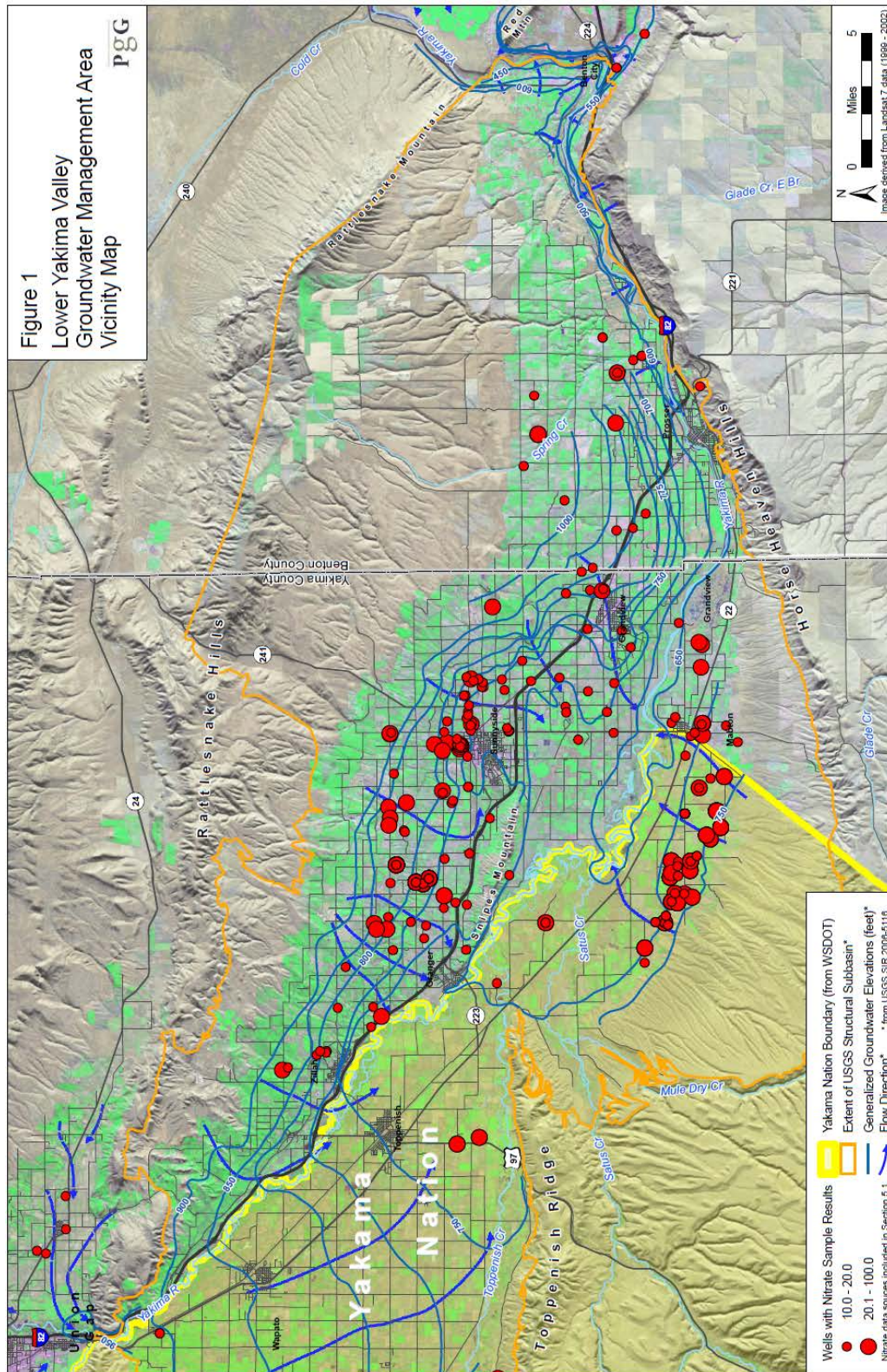
exchange transfusion

#### WEBSITES:

<https://www.ncbi.nlm.nih.gov/pubmed/9295837>

[http://www.nap.edu/catalog.php?record\\_id=4795](http://www.nap.edu/catalog.php?record_id=4795)

# GWMA Map (Attachment)




## Section 3: GWAC Public Opinion Survey Summary Report 2013

The Public Opinion survey immediately followed the healthcare provider survey in 2013. The GWAC designed the survey to gauge the public's awareness of the nitrate issue, its potential health impacts, and to gauge awareness of the GWMA program development. Bilingual Heritage University students conducted 136 door-to-door surveys and distributed Department of Health information on a variety of topics. The survey instrument was posted to the GWMA website and was offered at public events and health fairs during the next four years.





## GWAC Public Opinion Survey (Spanish)



LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

**Groundwater Management Area (GWMA):**  
*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

Forma # GWMA0001 A  
Refrito 7/25/13

### Lower Yakima Valley Groundwater Management Area Informational Public Questionnaire

☐ Encuesta terminada

☐ Se intentó hacer la encuesta/No se hizo:  
 No había nadie en casa \_\_\_\_\_ No se quiso hacer \_\_\_\_\_  
 Otra razón \_\_\_\_\_ Número de intentos \_\_\_\_\_

**\*Domicilio:** \_\_\_\_\_

**\*Número de parcela** \_\_\_\_\_ **\*Fecha de la encuesta** \_\_\_\_\_ **\*Encuestador** \_\_\_\_\_

**\*Información requerida**  
 El propósito de este cuestionario es saber más de los nitratos y la calidad del agua potable según las personas que viven en esta propiedad. Gracias por atendernos y compartir sus comentarios.

1. ¿De donde viene el agua de su casa?  
 POZO PRIVADO      POZO COMPARTIDO      AGUA DE LA COMUNIDAD      NO SÉ
2. Si usted tiene un pozo privado o compartido ¿de donde toma el agua para beber?  
 DE LA LLAVE      EMBOTELLADA      AGUA TRATADA
3. Si usted recibe su agua de un sistema comunitario ¿de donde toma el agua para beber?  
 DE LA LLAVE      EMBOTELLADA
4. ¿Sabe usted los riesgos potenciales de tomar agua que contenga altos niveles de nitratos? SI      NO
5. ¿Se le ha hecho prueba de nitratos a su agua? SI      NO      NO SÉ
6. ¿Se le ha hecho prueba de bacteria a su agua? SI      NO      NO SÉ
7. ¿Vive en casa propia o de renta? PROPIA      DE RENTA
8. Si usted renta ¿podría usted pedirle al dueño de la propiedad que le haga pruebas al agua? SI      NO
9. ¿A quién le confiaría usted que le dé información confiable acerca de nitratos en el agua?  
 \_\_\_\_\_
10. ¿Sabe usted si alguien se ha enfermado por tomar el agua potable de su casa? SI      NO  
 Por favor describa: \_\_\_\_\_
- ¿Se ha confirmado esto con un médico? SI      NO      NO SÉ
11. ¿Hace usted algo para asegurarse de que su agua sea segura para tomarse? SI      NO  
 Por favor describa: \_\_\_\_\_
12. ¿Por cuánto tiempo ha vivido en su casa? Años \_\_\_\_\_ Meses \_\_\_\_\_
13. ¿Vive en su casa algún niño menor de seis meses? SI      NO
14. ¿Vive alguna mujer embarazada en su casa? SI      NO
15. ¿Hay alguna persona en su casa con alguna enfermedad crónica? SI      NO
16. ¿Había escuchado usted del área de manejo de agua subterránea del valle bajo de Yakima o Lower Yakima Valley Ground Water Management Area (GWMA)? SI      NO
17. ¿Dónde había escuchado de GWMA? Por favor circule todos los que corresponden:  
 RADIO      TELEVISIÓN      PERIÓDICO      VECINOS      EN EL TRABAJO      EN LA CLÍNICA      OTROS
18. ¿Está usted interesado de que le visitemos en una fecha futura para evaluar su pozo? SI      NO  
 Si así es, por favor indique lo siguiente:  
 Nombre: \_\_\_\_\_  
 Domicilio de correo (calle o P.O. Box, Ciudad, Estado, Código postal) \_\_\_\_\_  
 Teléfono: \_\_\_\_\_ Correo electrónico: \_\_\_\_\_
19. ¿Usted tiene otra información de su pozo o archivos de lecturas de su pozo? SI      NO      NO SÉ

Gracias por participar en esta encuesta. Utilizaremos esta información para poder entender mejor lo que la gente sabe acerca de la contaminación del agua subterránea y para mejorar nuestros esfuerzos para informar a la gente a identificar y prevenir la contaminación de nitratos en el agua subterránea.



Lower Yakima Valley Groundwater Management Area

Informational Public Questionnaire

Por favor devuelva esta encuesta a: Lower Yakima Valley Groundwater Management Area, c/o Yakima County  
Public Services, 128 N 2<sup>nd</sup> St, Fourth Floor, Yakima WA 98901.

Web Version

Survey Answers

	LOWER YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA INFORMATIONAL PUBLIC QUESTIONNAIRE							
		Number	Percentage	TOTAL				
	Number of Households in Survey			300				
	Number of Surveys Completed	136	45%					
	Number of households Not Possible (dogs, gates, etc)	88	29%					
	Number of Households Declining	60	20%					
	Number of Households Not Attempted	16	5%					
	TOTAL	300	100%					
	QUESTION	YES	DON'T KNOW	NO	NOT ANSWERED	TOTAL		
#1	Where does the water in your home come from?	PRIVATE WELL	SHARED WELL	COMM. WELL	DON'T KNOW			
		122	5	2	7	136		
		90%	4%	1%	5%			
#2	If you have a private or shared well, where do you get your drinking water?	TAP WATER	BOTTLED WATER	TREATED WATER	NOT ANSWERED			
		69	24	41	2	136		
		51%	18%	30%	1%			
#3	If you are on a community water system, where do you get your drinking water	TAP WATER	BOTTLED WATER	TREATED WATER	NOT ANSWERED			
		1	0	0	1	2		
		50%		50%				
		YES	DON'T KNOW	NO	NOT ANSWERED	TOTAL		
#4	Are you aware of the potential health hazards in drinking water with high levels of nitrates?	94	35		7	136		
		69%	26%		5%			
#5	Has your well water been tested for nitrates?	73	23	40		136		
		54%	17%	29%				
#6	Has your well water been tested for bacteria?	45	28	63		136		
		33%	21%	46%				
		OWN	RENT					
#7	Do you own your home or rent?	115	17					
		85%	12%					
#8	If you rent, do you feel comfortable asking your landlord to have the water tested.	12		5		17		
		71%		29%				
#9	Who would you trust to give you reliable information about nitrates in drinking water? (answers on p.2)							

#10	Are you aware of anyone in your homes that has become ill from drinking your water?	6		125	5	136		
		4%		92%				
#11	Are there things you do to make sure your drinking water is safe? (answers on p. 2)	81	39	16	0	136		
		59%	29%	12%	0%			
#12	How long have you lived in your home							
	Less than a year	8						
	1-10years	50						
	10-15years	24						
	15-20year	13						
	20-43years	21						
	Not Answered	20						
#13	Is there a child under the age of six months in your household?	1		134	1	136		
		<1.0%		99.0%	<1.0%			
#14	Are there pregnant women in your household?	1		134	1	136		
		<1.0%		99%	<1.0%			
#15	Are there chronically ill people in your household?	7		128	1	136		
		5%		94%	<1.0%			
#16	Have you heard of the Lower Valley GWMA?	57		73	6	136		
		42%		54%	4%			
					Percentages rounded to the nearest			
#17	Where have you heard of the Lower Yakima Valley Ground Water Management Area (GWMA)	<b>RADIO</b>	<b>TV</b>	<b>NEWSPAPER</b>	<b>AT WORK</b>	<b>HEALTH CARE</b>	<b>OTHER</b>	<b>NOT ANSWERED</b>
		8	4	24	1	2	18	79
		5%	2%	17%	0%	0%	13.0%	58.0%
#18	Are you interested in being contacted for a survey of your well at a later date?	45		76	15	136		
		33%		56%	11%			
#19	Do you have any information about your well or your well log?	17	24	81	14	136		
		13%	18%	59%	10%			

## Survey Answers to Questions 9 and 11

#9	#11
Who would you trust to give you reliable information about nitrates in drinking water?	Are there things that you do to make sure your drinking water is safe?
18 Responses: County	42 Responses: Filter
14 Responses: Health Department	6 Responses: Test
10: Doctor	4: Purchase drinking water
9: Don't know	4-Reverse Osmosis
6: Government Agency	Have it checked
6: Independent Company	Inspection
3: Department of Health	Lab
2: Lab	A person was coming in that specializes in water treatment.
2: Testing Service	Refrigerator treats water
2: himself	Soft water tester
City	Buy Culligan
Culligan	Water Softener
Cascade Testing/Independent	Water system
Ask Owner	Whole house filter, considering upgrading (well drilled in 2009)
Down town	Zero test often number low
Drinking water Kinetico Personnel	
EPA	
Fed water	
Central Washington University	
Heritage University Students	
Local School	
Clean water in Tri Cities, from the fair	
4 years tested	
Labon Yakima	
My own research (not counting on 2nd hand info.)	
myself	
Nobody	
Anyone knows	
People who know about it	
Professionals who test the water	
Rain Water in Sunnyside	
Reputable servicer	
Service who tests water	
Somebody who test for nitrates	
Son	
Water officials @ clinic	
Water system facility	
Whoever his landlord tells him	
Yes but she/he lives in Texas	
Don't care	

## Section 4: Handouts

The GWAC created a library of English/Spanish public health and self-help handouts that were distributed with every survey, inserted in mailings, made available at public events and health fairs, and posted to the website. The purpose was to reinforce the health messages created by the GWAC, and remind private well owners of their responsibility to test and maintain their drinking water wells. Most handouts were published by the Washington State Department of Health (DOH). The exceptions were the list of certified laboratories in the GWMA area, and the “How to Keep Your Baby Safe from Nitrates in Drinking Water” handout.

The “How to Keep Your Baby Safe from Nitrates in Drinking Water” flyer was created in collaboration with the University of Washington’s Pediatric Environmental Health Specialty Unit (PEHSU). The GWAC kept local hospitals stocked with the English/Spanish flyer for distribution to their new mom patients during the GWMA program development. A handout for nurses – Nitrates, Blue Baby Syndrome, and Drinking Water: A Fact Sheet for Families – was also created and distributed.

For clinicians, a companion handout, Nitrates, Methemoglobinemia, and Drinking Water: A Fact Sheet for Clinicians and video were created to raise their awareness of possible nitrate exposure in their patients. PEHSU obtained authorization to offer Continuing Education Units (CEU) to participating healthcare providers.

## Handout: Updated Certified Laboratories

<b>Lower Yakima Valley GWMA Program</b> <b>Certified Testing Laboratories</b> (Updated July 23, 2013)				
Laboratory Name	Address	Phone	Web Site	Approximate Cost
<a href="#">Ag Health Laboratories, Inc.</a>	445 Barnard Boulevard Sunnyside, WA	(509) 836-2020	<a href="http://www.aghealthlabs.com">www.aghealthlabs.com</a>	Nitrate - \$30 Coliform - \$21
<a href="#">Benton-Franklin Health District Lab</a>	7102 West Okanogan Place Kennewick, WA	(509) 460-4206	<a href="http://www.bfhd.wa.gov">www.bfhd.wa.gov</a>	Nitrate - \$24 Coliform - \$24
<a href="#">Cascade Analytical Inc. - Yakima</a>	1008 West Ahtanum Road, #2 Yakima, WA	(509) 452-7707	<a href="http://www.cascadeanalytical.com">www.cascadeanalytical.com</a>	Nitrate - \$27.50 Coliform - \$25
<a href="#">Mukang Labs, Inc.</a>	2526 E. Saint Helens Street Pasco, WA	(509) 544-2159	<a href="http://www.mukanglabs.com">www.mukanglabs.com</a>	Nitrate - \$18.50 Coliform - \$20
<a href="#">Northwest Agricultural Consultants, Inc.</a>	2545 West Falls Ave. Kennewick, WA	(509) 783-7450	<a href="http://www.nwag.com">www.nwag.com</a>	Nitrate - \$17.50 Coliform - NA
<a href="#">Valley Environmental Laboratory</a>	201 East D Street Yakima, WA	(509) 575-3999	<a href="http://www.valleylab.net/">http://www.valleylab.net/</a>	Nitrate - \$35 Coliform - \$25
<p>All of the above laboratories are certified by the Washington State Department of Ecology to test for nitrate in drinking water. Ag Health Laboratories, Benton-Franklin Health District, Cascade Analytical, Mukang Labs and Valley Environmental Laboratory are also certified to test for coliform in drinking water.</p> <p>Costs shown for nitrate and coliform tests are approximate and subject to change.</p>				
<b>Lower Yakima Valley GWMA Program</b> <b>Laboratorios Certificados</b>				
Nombre del laboratorio	Dirección	Teléfono	Web Site	Costo aprox.
<a href="#">Ag Health Laboratories, Inc.</a>	445 Barnard Boulevard Sunnyside, WA	(509) 836-2020	<a href="http://www.aghealthlabs.com">www.aghealthlabs.com</a>	Nitratos - \$30 Coliforme - \$21
<a href="#">Benton-Franklin Health District Lab</a>	7102 West Okanogan Place Kennewick, WA	(509) 460-4206	<a href="http://www.bfhd.wa.gov">www.bfhd.wa.gov</a>	Nitratos - \$24 Coliforme - \$24
<a href="#">Cascade Analytical Inc. - Yakima</a>	1008 West Ahtanum Road, #2 Yakima, WA	(509) 452-7707	<a href="http://www.cascadeanalytical.com">www.cascadeanalytical.com</a>	Nitratos - \$27.50 Coliforme - \$25
<a href="#">Mukang Labs, Inc.</a>	2526 E. Saint Helens Street Pasco, WA	(509) 544-2159	<a href="http://www.mukanglabs.com">www.mukanglabs.com</a>	Nitratos - \$18.50 Coliforme - \$20
<a href="#">Northwest Agricultural Consultants, Inc.</a>	2545 West Falls Ave. Kennewick, WA	(509) 783-7450	<a href="http://www.nwag.com">www.nwag.com</a>	Nitratos - \$17.50 Coliforme - NA
<a href="#">Valley Environmental Laboratory</a>	201 East D Street Yakima, WA	(509) 575-3999	<a href="http://www.valleylab.net/">http://www.valleylab.net/</a>	Nitratos - \$35 Coliforme - \$25
<p>Todos los laboratorios en éste documento están certificados por el Departamento de Ecología del Estado de Washington para probar nitratos en el agua potable. Los laboratorios Ag Health Laboratories, Benton-Franklin Health District, Cascade Analytical, Mukang Labs, y Valley Environmental Laboratory también están certificados para probar la presencia de coliformes en el agua potable.</p> <p>El costo por la prueba de nitratos y coliforme es aproximado y sujeto a cambio.</p>				



# Private Well Water

*Coliform Bacteria and Nitrate Information for Private Well Users*

## **Why should my well water be tested?**

Drinking contaminated water is a health risk. Some contaminants cannot be seen, smelled, or tasted. Two of the most common contaminants in drinking water are coliform bacteria and nitrate and they can be harmful.

## **Who should be testing my well water?**

You or your landlord. Private well users are responsible for testing their own water. If you don't own your home but you use a private well, talk with your landlord about getting your water tested or seeing the most recent results. You can always take a water sample yourself and have it tested.

## **What should I test for and how often?**

The Department of Health recommends that you test your private well water every year for coliform bacteria and nitrate.

You should also test your water when:

- You notice a change in your water, such as taste, color, or smell.\*
- Your well has been flooded.
- You replace any part of your well system.
- Someone in your household is pregnant, nursing, or has an unexplained illness and you suspect your water may be at risk.
- You hear that a neighbor's water is contaminated.
- You live near industrial or agricultural activities.\*

\*These may require testing for something other than coliform or nitrate.

If you have had previous contamination problems or are concerned about specific contaminants, you may want to test your well water more often.

## **Where do I go to get my water tested?**

Certified drinking water labs are located across the state. The lab you select or your local health department can help you decide what to test for, how to collect samples, and how to understand results. There is a cost for these tests. Costs this year (2010) range from \$20 to \$25 per test for coliform bacteria, and \$30 to \$42 per test for nitrate. Most labs like to provide their own sample bottles.



**My nitrate level is *less than 10 ppm*, what should I do?**

Nitrate levels can vary throughout the year, so if your level is 5 ppm or higher, you may want to re-sample in six months.

**My nitrate level is *more than 10 ppm*, what should I do?**

If your nitrate test shows levels higher than 10 parts per million, find a different and safe drinking water supply. The quickest thing to do is to begin using bottled water for drinking and food preparation. Do NOT boil water with high nitrate. Boiling water may actually increase the nitrate level, making the problem worse!

Another option is to install a device or filter designed to remove nitrate from your water. These devices are often installed on kitchen faucets, where people get their water for drinking and cooking. Nitrate is not absorbed through the skin, so it is safe to clean and bathe with it.

Other, longer term solutions include:

- Drilling a deeper well into a different groundwater source;
- Connecting to a public water system; or
- Working with others in your community to develop a new public water system to serve your home and nearby neighbors.

**My test results came back with coliform in the water, what should I do?**

Coliform tests usually come back as SATISFACTORY or UNSATISFACTORY. If you receive a SATISFACTORY report, it means your water was free of these bacteria at the time of the sample. Be sure to test every year for coliform bacteria.

If you receive an UNSATISFACTORY report, it may be contaminated. Do not drink the water until it tests SATISFACTORY. Find a different and safe drinking water supply. The quickest thing to do is either begin using bottled water or boil all water for drinking and food preparation. This also includes water used for making ice or coffee, brushing teeth, and washing fruits and vegetables you eat raw. Boiling water rapidly for one minute usually kills bacteria.

Your lab and local health department can help you determine if you should resample, disinfect your well, or take other action based on your results.

**What are coliform bacteria and why should I care?**

Coliform bacteria are organisms that are present in the environment and in the feces of humans and animals. Coliform bacteria will not likely cause illness, but their presence in drinking water indicates disease-causing organisms may also be present.

**What is nitrate?**

Nitrogen is a chemical found in most fertilizers, animal manure, and in septic tanks. Natural bacteria in the soil can change nitrogen into nitrate. Rain water and irrigation water can carry nitrate down through the soil into the groundwater.

**What can nitrate do to me?**

Too much nitrate in your body makes it harder for red blood cells to carry oxygen. While many people do not notice a difference, this can be very dangerous for infants and pregnant women. Infants exposed to high amounts of nitrate may develop "blue-baby syndrome," a condition that is rare but can be fatal.

**What are the symptoms of blue-baby syndrome?**

Symptoms can be confused with other illnesses. An infant with mild to moderate blue-baby syndrome may have diarrhea, vomiting, and be lethargic.

In more serious cases, the infant may have:

- skin that becomes gray, darker brown, or blue, or
- lips, finger or toe nails with a blue-like color, or
- trouble breathing.

**My test results came back with *both* coliform and nitrate, what should I do?**

Find a different and safe drinking water supply. The quickest thing to do is to begin using bottled water for drinking and food preparation. Boiling water kills coliform bacteria, but does not remove nitrate. Do NOT boil water with both coliform and nitrate. It may increase the nitrate level, making the problem worse! See other options under nitrate and coliform above.

**My test results came back OK, but I don't like the taste/smell/appearance of my water. What is wrong with it?**

Some contaminants make water smell, taste, or look bad but are not harmful to your health. Your lab and local health department can help you determine if you need to test or treat your water.

**What about Home Water Treatment Units? I've heard that these can help.**

Point of use (POU) filter systems treat water at a single tap. Point of entry (POE) filter systems treat water used throughout the house.

Three types of systems that can remove nitrate from your water are:

- Reverse Osmosis Unit
- Distillation Unit
- Anion Exchange Unit

Important: All POU and POE filter systems or treatment units need maintenance to operate effectively. If they are not maintained properly, contaminants may accumulate in the units and make your water worse. In addition, some vendors may make claims about their effectiveness that are not based on science. The EPA does not test or certify treatment units, but two organizations that do are NSF International and Underwriters Laboratory.

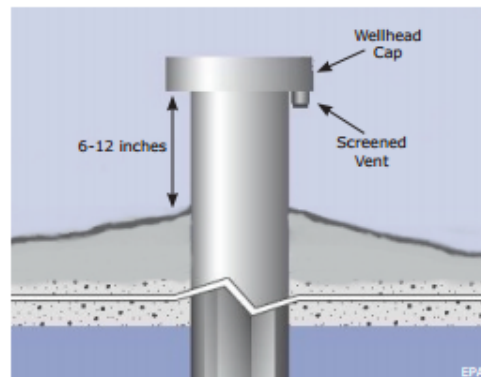
**How can I protect my well water from contamination?**

Make sure your wellhead extends 6 to 12 inches above the surface of the ground and is capped to keep contaminants out. Seal the ground around the wellhead and slope it away so water does not collect and seep into the well.

It is important to keep your well safe from potential contaminants that may be around your home. The further away from contamination sources, the better.

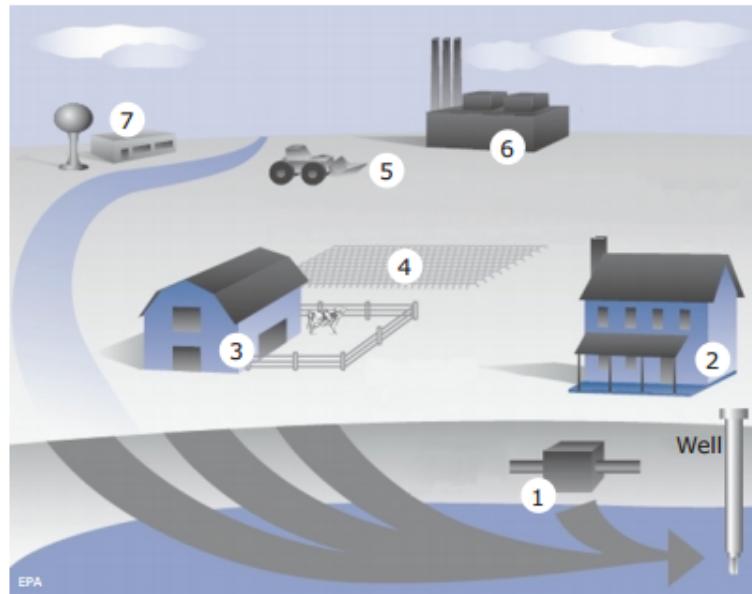
Experts suggest your well should be at least:

- 50 feet from a septic tank,
- 100 feet from the edge of a drainfield, fuel tank, barn, and any storage shed for fertilizers and pesticides, and
- 250 feet from a manure stack.



## Potential Well Contaminants

1. Septic Tank
2. Household Wastes
3. Livestock Wastes
4. Pesticides and Fertilizers
5. Landfills
6. Local Industries
7. Underground Storage Tanks



## Additional Resources

### Local Health Departments

[www.doh.wa.gov/LHJMap/LHJMap.htm](http://www.doh.wa.gov/LHJMap/LHJMap.htm)

### Certified Labs in Your Area

[www.ecy.wa.gov/apps/eap/acclabs/labquery.asp](http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp)

### Certifying Organizations for Home Water Treatment Units

NSF International (Formerly National Sanitation Foundation), [www.nsf.org](http://www.nsf.org)

Underwriters Laboratory, [www.ul.com](http://www.ul.com)

### Center for Disease Control and Prevention Publications

Private Wells, [www.cdc.gov/healthywater/drinking/private/wells/location.html](http://www.cdc.gov/healthywater/drinking/private/wells/location.html)

Emergency disinfection of wells, <http://emergency.cdc.gov/disasters/wellsdisinfect.asp>

### Environmental Protection Agency Publications

Household wells, [www.epa.gov/safewater/privatewells/pdfs/household\\_wells.pdf](http://www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf)

Secondary Standards, [www.epa.gov/safewater/consumer/2ndstandards.html](http://www.epa.gov/safewater/consumer/2ndstandards.html)

Filtration Facts booklet, [www.epa.gov/safewater/faq/pdfs/fs\\_healthseries\\_filtration.pdf](http://www.epa.gov/safewater/faq/pdfs/fs_healthseries_filtration.pdf)

Source Water Protection, <http://cfpub.epa.gov/safewater/sourcewater>



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To make a request, call 1-800-525-0127 or 1-800-833-6388 (TTY/TDD).



# Agua de Pozos Privados

*Información sobre las bacterias coliformes y el nitrato para usuarios de pozos privados*

## **¿Por qué debería hacer un análisis del agua de mi pozo?**

Beber agua contaminada es un riesgo para la salud. Algunos contaminantes no se pueden ver, oler ni notar por el sabor. Dos de los contaminantes más comunes del agua potable son las bacterias coliformes y el nitrato, los cuales pueden ser nocivos.

## **¿Quién debería analizar el agua de mi pozo?**

Usted o su arrendador. Los usuarios de pozos privados son responsables de analizar su propia agua. Si usted no es propietario de su vivienda pero utiliza un pozo privado, hable con su arrendador para analizar el agua o ver los resultados más recientes. Siempre podrá tomar una muestra de agua usted mismo y hacerla analizar.

## **¿Qué debería buscar en el análisis y con qué frecuencia?**

El Departamento de Salud recomienda que analice el agua de pozo privado todos los años para verificar que no existan bacterias coliformes y nitrato.

También deberá analizar el agua cuando:

- Note un cambio en el agua, tal como el sabor, color y olor.\*
- El pozo se haya inundado.
- Reemplace cualquier parte de su sistema de pozo.
- Alguna mujer de su hogar esté embarazada, amamantando o tenga una enfermedad inexplicable y usted sospeche de que el agua puede estar en riesgo.
- Escuche que el agua de su vecino está contaminada.
- Viva cerca de zonas industriales o agrícolas.\*

\*Estos casos pueden requerir un análisis para evitar la existencia de otros elementos distintos de las coliformes o el nitrato.

Si ha tenido problemas de contaminación previos o está preocupado por contaminantes específicos, usted debería analizar el agua del pozo con mayor frecuencia.

## **¿Dónde me dirijo para analizar el agua?**

Los laboratorios de análisis de agua potable certificados se encuentran en todo el estado. El laboratorio que seleccione o el departamento de salud local podrán ayudarlo a decidir qué buscar en el análisis, cómo tomar las muestras y cómo interpretar los resultados. Estos análisis tienen un costo. Los costos de este año (2010) van desde los \$20 a los \$25 por análisis de bacterias coliformes, y desde los \$30 a los \$42 para el análisis de nitrato. La mayoría de los laboratorios prefieren proporcionar sus propios recipientes para muestra.



### **El nivel del nitrato es menor de 10 ppm, ¿qué debo hacer?**

Los niveles de nitrato pueden variar a lo largo del año, por lo tanto si el nivel es de 5 ppm o mayor, deberá volver a tomar una prueba dentro de seis meses.

### **El nivel de nitrato es mayor de 10 ppm, ¿qué debo hacer?**

Si su análisis de nitrato muestra niveles mayores a 10 partes por millón, busque un suministro de agua potable diferente y más seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada para beber y cocinar. No hierva agua con altos niveles de nitrato. Hervir el agua puede incrementar el nivel de nitrato, empeorando el problema!

Otra opción es instalar un dispositivo o filtro diseñado para eliminar el nitrato del agua. Estos dispositivos se instalan con frecuencia en los grifos de la cocina, donde las personas toman agua para beber y cocinar. El nitrato no se absorbe a través de la piel, por lo tanto es seguro utilizar esta agua para limpiar y bañarse.

Otras soluciones a largo plazo incluyen:

- Cavar un pozo más profundo en una fuente diferente de aguas subterráneas;
- Conectarse a un sistema de agua público; o
- Trabajar con otras personas de su comunidad para desarrollar un nuevo sistema público de agua para su hogar y los vecinos de la zona.

### **Los resultados de mi análisis indican coliformes en el agua, ¿qué debo hacer?**

Los análisis de coliformes por lo general indican SATISFACTORIO o NO SATISFACTORIO. Si recibe un informe SATISFACTORIO, significa que su agua no contiene estas bacterias al momento de tomar la muestra. Asegúrese de realizar este análisis de coliformes todos los años.

Si recibe un informe NO SATISFACTORIO, el agua podría estar contaminada. No beba el agua hasta que el análisis sea SATISFACTORIO. Busque un suministro de agua potable distinto y seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada o hervida para beber y cocinar. Además, debe utilizarla para preparar hielo o café, lavarse los dientes y lavar frutas y verduras que come crudas. Hervir el agua durante un minuto por lo general mata las bacterias.

El laboratorio y el departamento de salud local pueden ayudarlo a determinar si debe volver a tomar una muestra, desinfectar el pozo o tomar otras medidas basadas en el resultado.

### **¿Qué son las bacterias coliformes y por qué debería tener cuidado?**

Las bacterias coliformes son organismos que están en el medio ambiente y en las heces de humanos y animales. Las bacterias coliformes probablemente no causan enfermedades, pero su presencia en el agua potable indica que también puede haber organismos causantes de enfermedades.

### **¿Qué es el nitrato?**

El Nitrógeno es un químico que se encuentra en la mayoría de los fertilizantes, en estiércol de animales y en los tanques sépticos. Las bacterias naturales de la tierra pueden cambiar el nitrógeno a nitrato. El agua de lluvia y el agua de riego pueden arrastrar el nitrato por debajo de la tierra hacia las aguas subterráneas.

### **¿Qué me puede hacer el nitrato?**

El exceso de nitrato en el cuerpo dificulta el transporte de oxígeno que deben realizar los glóbulos rojos. Aunque muchas personas no noten la diferencia, esto puede ser muy peligroso para los bebés y las mujeres embarazadas. Los bebés expuestos a grandes cantidades de nitrato pueden desarrollar el "síndrome del bebé azul," una enfermedad extraña pero que puede ser fatal.

### **¿Cuáles son los síntomas del síndrome del bebé azul?**

Los síntomas se pueden confundir con los de otras enfermedades. Un bebé con el síndrome del bebé azul leve a moderado puede tener diarrea, vómitos y estar apático.

En casos más graves el bebé puede tener:

- piel que cambia a color gris, café oscura o azul, o
- labios, dedos o las uñas de los pies de color azulado; o
- problemas para respirar.

### **Los resultados de mi análisis indican *tanto* coliformes *como* nitrato, ¿qué debo hacer?**

Busque un suministro de agua potable distinto y seguro. Lo primero que debe hacer es comenzar a utilizar agua embotellada para beber y cocinar. Hervir el agua mata las bacterias coliformes, pero no elimina el nitrato. NO hierva agua con coliformes y nitrato. Puede incrementar el nivel de nitrato, empeorando el problema! Consulte otras opciones bajo nitrato y coliformes más arriba.

### **Los resultados del análisis indican que está bien, pero no me gusta el sabor/olor/la apariencia del agua. ¿Qué está pasando?**

Algunos contaminantes hacen que el agua no tenga buen olor, sabor o apariencia pero no son nocivos para su salud. Su laboratorio y el departamento de salud local pueden ayudarlo a determinar si necesita analizar o tratar su agua.

### **¿Qué son las unidades domésticas de tratamiento de agua? He escuchado que son útiles.**

Los sistemas de filtro en el punto de uso (POU) tratan el agua en un sólo grifo. Los sistemas de filtro en el punto de entrada (POE) tratan el agua utilizada por toda la vivienda.

Los tres tipos de sistemas que pueden eliminar el nitrato del agua son:

- Unidad de ósmosis inversa
- Unidad de destilación
- Unidad de intercambio iónico

Importante: Todos los sistemas de filtro POU y POE o las unidades de tratamiento requieren mantenimiento para funcionar bien. Si no reciben el mantenimiento adecuado, los contaminantes se podrían acumular en las unidades y empeorar el agua. Además, algunos vendedores podrían declarar su efectividad aunque no esté basado en la ciencia. EPA no analiza ni certifica las unidades de tratamiento, pero sí lo hacen dos organizaciones: la NSF International y el Underwriters Laboratory.

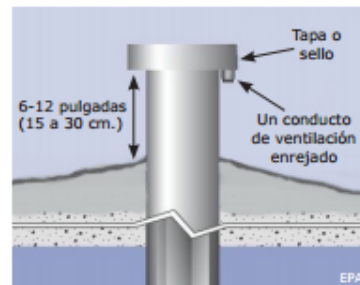
### **¿Cómo puedo proteger el agua de mi pozo de la contaminación?**

Asegúrese que la boca del pozo se extienda entre 6 a 12 pulgadas (15 a 30 cm.) por encima de la superficie del suelo y que esté tapado para que no entren los contaminantes. Selle el suelo alrededor de la boca del pozo y hágalo en declive para que el agua no se acumule y filtre dentro del pozo.

Es importante mantener el pozo protegido de contaminantes potenciales que pueden estar alrededor de su vivienda. Cuanto más lejos de las fuentes de contaminación, mucho mejor.

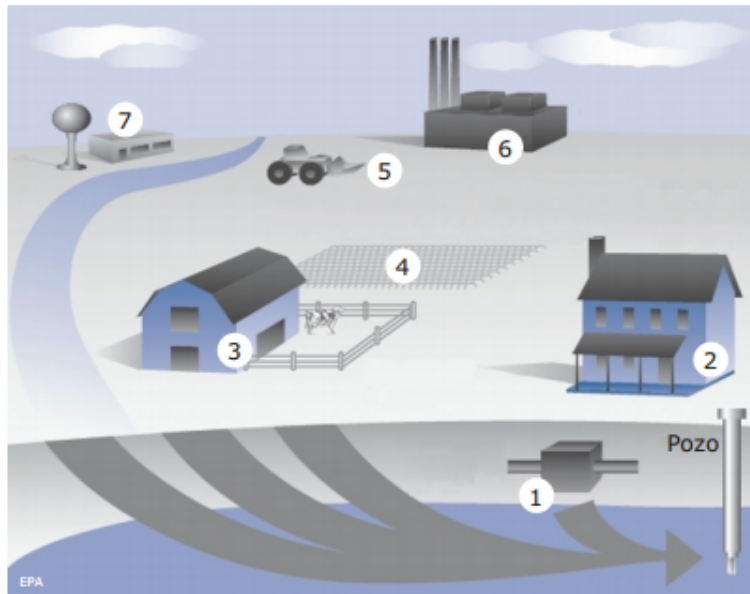
Los expertos sugieren que el pozo debe estar al menos:

- a 50 pies (15 metros) del tanque séptico,
- a 100 pies (30 metros) del borde de un campo de drenaje, tanque de combustible, graneros y cualquier depósito de fertilizantes y pesticidas, y
- a 250 pies (75 metros) de un montículo de estiércol.



### Fuentes potenciales de contaminación del agua de pozos

1. Tanque séptico
2. Residuos domésticos
3. Residuos de animales
4. Pesticidas y fertilizantes
5. Vertedero
6. Industria local
7. Tanques de almacenamiento subterráneo



### Recursos adicionales (información en inglés)

#### Departamentos de salud locales

[www.doh.wa.gov/LHJMap/LHJMap.htm](http://www.doh.wa.gov/LHJMap/LHJMap.htm)

#### Laboratorios certificados en su zona

[www.ecy.wa.gov/apps/eap/acclabs/labquery.asp](http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp)

#### Organizaciones certificadoras de unidades domésticas de tratamiento de agua

NSF International (Anteriormente, Fundación de Sanidad Nacional), [www.nsf.org](http://www.nsf.org)

Underwriters Laboratory, [www.ul.com](http://www.ul.com)

#### Publicaciones del Centro para el Control y la Prevención de Enfermedades

Pozos privados, [www.cdc.gov/healthywater/drinking/private/wells/location.html](http://www.cdc.gov/healthywater/drinking/private/wells/location.html)

Desinfección de emergencia de pozos, <http://emergency.cdc.gov/disasters/wellsdisinfect.asp>

#### Publicaciones de la Agencia de Protección Ambiental

Pozos domésticos, [www.epa.gov/safewater/privatewells/pdfs/household\\_wells.pdf](http://www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf)

Estándares secundarios, [www.epa.gov/safewater/consumer/2ndstandards.html](http://www.epa.gov/safewater/consumer/2ndstandards.html)

Folleto sobre datos de filtración, [www.epa.gov/safewater/faq/pdfs/fs\\_healthseries\\_filtration.pdf](http://www.epa.gov/safewater/faq/pdfs/fs_healthseries_filtration.pdf)

Protección de fuente de agua, <http://cfpub.epa.gov/safewater/sourcewater>



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Oct. 2008  
DOH 331-179  
Revised

## Questions & Answers

# Public Health Advisory Coliform

### **Why must I boil my water?**

Recent testing shows that your water system is contaminated with organisms that could cause illness.

### **Who can be affected? Can I become ill?**

Anyone who drinks contaminated water may become ill. Infants, young children, the elderly, and people with severely compromised immune systems are more at risk of illness.

### **Who are people with compromised immune systems?**

People who are on chemotherapy, organ or bone marrow recipients, those with HIV or AIDS, malnourished children, infants, and some of the elderly have compromised or weakened immune systems. An infection from a disease-causing organism may lead to very serious health problems for these people.

### **Can these diseases be spread in ways other than drinking the water?**

Yes. Many of these disease-causing organisms are shed in the feces of infected people. In fact, some infected people do not have any symptoms but still shed these organisms. Childcare workers, young children who attend childcare, and caregivers for people who are sick and shedding these organisms are at the greatest risk of becoming ill. Washing hands with soap and water after using the toilet and before preparing food prevents the spread of diseases to others.

### **What are the symptoms to watch for?**

#### **What should I do if I think I have a waterborne illness?**

Disease-causing organisms in water can cause diarrhea, stomach cramps, bloating, gas, fatigue, weight loss, nausea, vomiting, and/or fever. Symptoms may appear as early as a few hours to several days after infection and may last more than two weeks. If you are ill with these symptoms, contact your health care provider.

### **How can I make the water safe?**

Boiling is the best way to ensure water is free of illness-causing organisms. Bring the water to a rolling boil for one minute. When it cools, refrigerate the water in clean covered containers.

If you don't want to boil your water, you can disinfect the water using household bleach. Do not use bleach that contains perfume, dyes, or other additives. Use 1/8-teaspoon bleach per gallon of water, mix thoroughly, and then let stand for 60 minutes before using.



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

Department of Health Coliform

### Can I use bottled water?

You can use purchased bottled water. If you choose to use bottled water, Department of Health recommends water that is:

- Reverse-osmosis treated.
- Distilled.
- Filtered through an “absolute” one micron or smaller filter.

Carbonated water in cans or bottles is usually filtered or heated to remove illness-causing organisms.

### During a health advisory, can I use tap water for...?

Drinking	No	Coffee or tea	No
Ice cubes	No	Showers/Baths	Yes
Brushing teeth	No	Washing clothes	Yes
Baby's formula	No	Baby's bath	See below
Washing vegetables/fruits	No	Washing dishes	See below
Preparing food	No	Pet's water bowl	Contact veterinarian

### Can I bathe my baby or child using tap water?

Yes, as long as they do not drink any of the water. Don't let babies suck on a washcloth, as they will be ingesting some of the water.

### Can I wash dishes?

You can use your dishwasher if you use the sanitizing/heat cycle and commercial dishwashing detergent. You can hand wash dishes, rinse them in a diluted bleach solution—one teaspoon household bleach to one gallon of water—and then let dishes air dry.

### What must be done to fix the problem?

Fixing the problem could be different in each situation depending on whether the problem is at the water source or in the water lines. Usually, in every case the water lines will need to be flushed and the whole system will need to be disinfected using chlorine. The water will then be tested to make sure it is free of coliform bacteria.

### How long will this health advisory be in effect?

This health advisory will remain in effect until the water is tested and results show that it meets public health drinking water standards. Your water system will notify you when that occurs.

### For more information:

**Personal medical questions:** Contact your health care provider (physician, nurse consultant, etc.)

**Call your local health jurisdiction** with general questions about infectious disease, communicable disease transmission, symptoms, causes and prevention of waterborne disease.



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## Preguntas y Respuestas

# Advertencia de Salud Pública Coliforme

### ¿Por qué debo hervir el agua?

Recientemente, se han hecho análisis del sistema de agua potable que demuestran que el agua está contaminada con organismos que pueden causar enfermedades.

### ¿A quién le afecta? ¿Puedo enfermarme?

Cualquier persona que beba agua contaminada puede enfermarse. Los bebés, niños, ancianos y personas con sistemas inmunológicos comprometidos tienen mayor riesgo de enfermarse.

### ¿Quiénes son las personas con sistemas inmunológicos comprometidos?

Las personas con sistemas inmunes comprometidos incluyen personas que reciben la quimioterapia, personas que reciben órganos o trasplante de médula ósea, las personas con VIH o SIDA, niños desnutridos, bebés, y algunos ancianos. Si una de estas personas se infecta de un organismo que causa enfermedades, puede resultar en problemas de salud muy graves.

### ¿Pueden estas enfermedades propagarse por otros medios además del agua potable?

Sí. Muchos organismos que causan enfermedades se eliminan en las heces de personas infectadas. Algunas personas infectadas no tienen síntomas, pero pueden eliminar estos organismos en las heces. Los niños pequeños que van al Kinder y los trabajadores que los cuidan, o las personas que cuidan de personas enfermas que eliminan estos organismos, corren el riesgo de enfermarse. Lavarse las manos con jabón y agua después de ir al baño y antes de preparar la comida previene la propagación de enfermedades a los demás.

### ¿Cuáles son los síntomas? ¿Qué debo hacer si pienso que tengo una enfermedad transmitida por el agua?

Las enfermedades que los organismos en el agua pueden causar son diarrea, calambres estomacales, inflamación, gas, mucho cansancio, pérdida de peso, náusea, vómito, o fiebre. Los síntomas pueden aparecer a las pocas horas o después de varios días de infectarse. Pueden durar más de dos semanas. Si está enfermo con estos síntomas, contacte a un profesional de la salud.

### ¿Qué puedo hacer para que el agua este limpia?

Hervir el agua es la mejor forma para asegurarse que esté libre de organismos que causan enfermedades. Ponga el agua en la estufa hasta que hierva y deje hervir el agua por un minuto. Cuando se enfríe, guárdela en un recipiente limpio y cubierto en el refrigerador. Si no quiere hervir el agua, Usted puede desinfectar el agua con cloro de uso casero. No use cloro que contenga perfume, colorantes, u otros aditivos. Use 1/8 cucharadita de cloro por galón de agua; mezcle bien y deje reposar una hora antes de usar.



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER



### ¿Puedo usar agua embotellada?

Usted puede comprar agua embotellada. Si Usted escoge agua embotellada, el Departamento de Salud recomienda que el agua sea:

- Tratada por osmosis inversa
- Destilada
- Filtrada con un filtro de un micrón “absoluto” o menor

El agua carbonatada de lata o botella ha sido filtrada o calentada para quitar organismos que causan enfermedades.

### Bajo una advertencia de salud pública, ¿puedo usar el agua de la llave para...?

Beber	No
Cubos de hielo	No
Cepillar los dientes	No
Preparar el biberón	No
Lavar verduras/frutas	No
Preparar comida	No
Café o té	No
Duchas/baños	Sí
Lavar la ropa	Sí
El baño del bebé	Vea abajo
Lavar los platos	Vea abajo
El tazón de agua de las mascotas	Contacte al veterinario

### ¿Puedo bañar a mi bebé o niño con el agua de grifo?

Sí, mientras no beban nada del agua. No deje que los bebés chupen la toallita porque beberían algo del agua.

### ¿Puedo lavar los platos?

Usted puede usar el lavaplatos si utiliza el ciclo de esterilizador/calentador y detergente para lavaplatos comercial. Usted puede lavar los platos a mano, y enjuagar con una solución de agua y lejía- una cucharadita de lejía de uso casero por cada galón de agua. Después deje que se sequen al aire.

### ¿Qué hace falta para solucionar el problema?

La solución del problema es diferente en cada situación, dependiendo si el problema está en las tuberías o en la fuente principal del agua. Normalmente, en cada situación, hay que limpiar las tuberías y desinfectar el sistema entero con cloro. Entonces se analiza el agua para asegurar que esté libre de bacteria coliform.

### ¿Hasta cuando durará esta advertencia de salud?

Esta advertencia de salud estará en efecto hasta que el agua sea analizada y los resultados cumplan con las normas de salud para el agua potable. Cuando esto ocurra, se notificará al público.

### Para mayor información:

**Preguntas médicas personales:** Contacte a un profesional de salud (médico, enfermero, etc.)

**Llame a la oficina de salud local en su área** con preguntas generales acerca de las enfermedades infecciosas, transmisión de enfermedades, los síntomas, las causas y la prevención de enfermedades transmitidas por el agua.

El Departamento de Salud es una agencia que practica la igualdad de oportunidades en la selección de personal. Para personas con discapacidades, este documento está disponible en otros formatos. Por favor llame al 1-800-525-0127 (TTY/TDD 1-800-833-6388). Para recibir copias adicionales de esta publicación, llame al 1-800-521-0323. Esta publicación y otras están disponibles en el sitio de Internet <http://www.doh.wa.gov/ehp/dw>



## Questions & Answers

# Nitrate in Drinking Water

Nitrate is a chemical found in most fertilizers, manure, and liquid waste discharged from septic tanks. Natural bacteria in soil can convert nitrogen into nitrate. Rain or irrigation water can carry nitrate down through the soil into groundwater. Your drinking water may contain nitrate if your well draws from this groundwater.

**Nitrate is an acute contaminant. That means one exposure can affect a person's health.**

### How does nitrate affect health?

It reduces the ability of red blood cells to carry oxygen. In most adults and children, these red blood cells rapidly return to normal. However, in infants it can take much longer for the blood cells to return to normal. Infants who drink water with high levels of nitrate (or eat foods made with nitrate-contaminated water) may develop a serious health condition due to the lack of oxygen. This condition is called methemoglobinemia or "blue baby syndrome." Some scientists think diarrhea makes this problem worse.

Low levels of nitrate in water will not have a long-lasting effect on your baby. If your baby doesn't have any of signs of blue baby syndrome, you do not need to have a doctor test for methemoglobinemia.

### What are the signs of blue baby syndrome?

**Moderate to serious** blue baby syndrome may cause brownish-blue skin tone due to lack of oxygen. This condition may be hard to detect in infants with dark skin. For infants with dark skin, look for a bluish color inside the nose and mouth, on the lips, or fingernail and toenail beds.

**Mild to moderate** blue baby syndrome may cause signs similar to a cold or other infection (fussy, tired, diarrhea or vomiting). While there is a blood test to see if an infant has blue baby syndrome, doctors may not think to do this test for babies with mild to moderate symptoms.

### What should I do if my infant has blue baby syndrome?

Take a baby who has brownish-blue skin tone or a bluish color to the lips, tongue, gums, nail beds, or nose to a hospital immediately. A medication called "methylene blue" will quickly return the baby's blood to normal.

### Does the state regulate nitrate in drinking water?

Yes. State law requires public water systems to sample for many contaminants, including nitrate, on a regular basis. Our drinking water quality standard for nitrate is 10 milligrams per liter (mg/L). Public water systems with nitrate levels over 10 mg/L must notify people who receive water from them.



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

**Can I prevent blue baby syndrome?**

Yes. Do not give infants younger than 12 months drinking water with nitrate levels above 10 mg/L. Do not offer high-nitrate vegetables such as beets, broccoli, carrots, cauliflower, green beans, spinach, and turnips until the baby is at least seven months old.

Nitrate levels in well water can vary throughout the year. If you have a private well and you're not sure about your water quality, you may want to use bottled water to prepare your baby's food and drinks. Although boiling water kills bacteria, it will not remove chemicals such as nitrate. In fact, boiling may actually increase the nitrate level.

**Will breast-feeding give my infant blue baby syndrome?**

Low levels of nitrate have been found in breast milk, but the levels are not high enough to cause blue baby syndrome.

**Can nitrate affect adults?**

Although red blood cells quickly return to normal, some health conditions can make people more susceptible to health problems from nitrate. Individuals with the following health conditions should not drink water with more than 10 mg/L of nitrate:

- Individuals who don't have enough stomach acids.
- Individuals with an inherited lack of the enzyme that converts affected red blood cells back to normal (methemoglobin reductase).
- Women who are pregnant or trying to become pregnant. Some studies have found an increased risk of spontaneous abortion or certain birth defects.

**How can I tell if my well water has nitrate?**

Shallow wells, poorly sealed or poorly constructed wells, and wells that draw from shallow aquifers are at greatest risk of nitrate contamination. Manure and septic tank waste may also contain disease-causing bacteria and viruses.

If you own a private well, we recommend that you test for coliform bacteria and nitrate every year. Your county health department can tell you where you can get your water tested and may have specific recommendations for testing. Many certified labs in Washington charge \$20 to \$40 per test. If your nitrate test results are 5 mg/L or higher, you may want to re-sample in six months.

**Where can I get more information?**

**If you get your water from a public water system**, call your water utility or the state Department of Health at 800-521-0323. You can also visit online at <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater.aspx>

**If you have a private well**, call your local health department. You can also find information in *Private Wells: Information for owners* (331-349) a publication available in English and Spanish at <https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm>

**For a list of certified labs**, visit the state Department of Ecology online at <http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp> Under "Location," select your state, city, and county. Scroll down and click on "Show results." Click on the name of a lab to see the tests it performs. Call the lab to make sure it's accredited to analyze for nitrate in drinking water.



If you need this publication in an alternate format, call 800-525-0127. For TTY/TDD, call 800-833-6388.



## Preguntas y Respuestas

# Nitratos en el agua potable

El nitrato es un químico que se encuentra en la mayoría de los fertilizantes, estiércol, y residuos líquidos que se liberan de los tanques sépticos. Las bacterias naturales del suelo pueden convertir nitrógeno al nitrato. La lluvia o agua de irrigación puede llevar el nitrato a través del suelo hasta las aguas subterráneas. Su agua potable puede contener nitrato si su pozo saca agua de tales aguas subterráneas.

**El nitrato es un contaminante que puede ocasionar enfermedades agudas, lo que significa que una sola exposición puede afectar a la salud de alguien.**

### ¿Cómo afecta a la salud el nitrato?

El nitrato reduce la capacidad de los glóbulos rojos para llevar oxígeno. En la mayoría de los adultos y niños, estos glóbulos rojos se normalizan rápidamente. Sin embargo, en los lactantes, los glóbulos rojos pueden demorar más tiempo para normalizarse. Los lactantes que beben agua con altos niveles de nitrato (o comen alimentos hechos con agua contaminada con nitrato) pueden desarrollar una enfermedad seria debido a la falta de oxígeno. Esta enfermedad se llama metahemoglobinemia o "síndrome del bebé azul." Algunos científicos piensan que la diarrea puede empeorar este problema.

Los niveles bajos de nitrato en el agua no tendrán un efecto de largo plazo en su bebé. Si su bebé no tiene ninguno de los signos del síndrome del bebé azul, no es necesario que su doctor le examine por la enfermedad de metahemoglobinemia.

### ¿Cuáles son los signos del síndrome del bebé azul?

El síndrome del bebé azul **moderado a serio** puede causar un tono de piel café-azulado dado la falta de oxígeno. Esta condición puede ser difícil de detectar en lactantes con piel oscura. Para bebés con piel oscura, busca un color azulado dentro de la nariz y la boca, en los labios, o la piel debajo de las uñas de las manos o los pies.

El síndrome del bebé azul **suave a moderado** puede causar signos parecidos a un resfriado u otra infección (irritado, cansado, con diarrea o vómitos). Aunque existe una prueba de sangre para ver si un lactante tiene el síndrome del bebé azul, es posible que los médicos no hagan esta prueba para los bebés con síntomas suaves a moderados.

### ¿Qué debo hacer si mi bebé tiene el síndrome del bebé azul?

Lleve el bebé al hospital de inmediato si el tono de la piel tiene un color café-azulado o tiene un color azulado en los labios, la lengua, las encías, la piel debajo de las uñas y la nariz. Un medicamento llamado "azul de metileno" normalizará rápidamente la sangre del bebé.

### ¿Está regulado por el estado el nitrato en el agua?

Sí. La ley estatal requiere que los sistemas de agua pública hagan pruebas para muchas contaminantes incluyendo el nitrato con regularidad. Nuestra norma para calidad del agua es 10 miligramos por litro (mg/L). Los sistemas de agua pública que contienen niveles de nitrato por encima de 10 mg/L deben notificar a las personas quien recibe agua de ellos.



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### **¿Puedo prevenir el síndrome del bebé azul?**

Si. No dé a los bebés menores de 12 meses de edad agua potable con niveles de nitrato más alto de 10 mg/L. No les dé verduras con alto contenido en nitrato como la remolacha, brócoli, zanahorias, coliflor, ejotes o judías, espinaca, y nabos hasta que el bebé tenga más de siete meses de edad.

Los niveles de nitrato en el agua de pozo pueden variar a través del año. Si usted tiene un pozo privado y no está seguro de la calidad del agua, es posible que desee usar agua en botella para preparar la comida y bebidas de su bebé. Aunque hervir el agua elimina las bacterias, no remueve químicos como el nitrato. De hecho, hirviendo causa la evaporación del agua que puede resultar en el incremento del nivel de nitrato.

### **¿Puede la lactancia materna ocasionar el síndrome del bebé azul?**

Se ha encontrado bajos niveles de nitrato en la leche materna, pero los niveles no son bastantes altos para causar el “síndrome del bebé azul.”

### **¿Puede el nitrato afectar a los adultos?**

Aunque las células rojas vuelven rápidamente a la normalidad, las condiciones de salud de algunas personas las hacen más susceptibles a los problemas de salud por nitrato. Las personas con las siguientes condiciones de salud no deberían beber agua con más de 10 mg/L de nitrato:

- Las personas que no tienen suficientes ácidos estomacales.
- Las personas con pérdida hereditaria de la enzima que convierte los glóbulos rojos afectados en células normales (metahemoglobina reductasa).
- Las mujeres embarazadas o que están tratando de quedar embarazadas. Alto contenido de nitratos puede incrementar el riesgo de aborto espontáneo o ciertos defectos de nacimiento.

### **¿Cómo puedo saber si mi agua de pozo tiene nitrato?**

Los pozos poco profundos, mal sellados o contruidos o los pozos que extraen agua de acuíferos poco profundos tienen riesgo más alto de tener agua contaminada con nitrato. El abono (estiércol) y los desechos de un tanque séptico pueden también contener bacterias y virus que causan enfermedades.

Si usted es el dueño de un pozo privado nosotros recomendamos que analice el agua por bacterias y nitrato cada año. El departamento de salud de su condado puede decirle donde puede obtener el análisis de su agua y pudiera tener recomendaciones específicas para el análisis. Muchos laboratorios certificados cobran entre \$20 a \$40 por análisis. Si el resultado del análisis de nitrato es de 5 mg/L o más alto, recomendamos que vuelva a hacer otro análisis en 6 meses.

### **¿Dónde puedo obtener más información?**

Si usted obtiene agua de un sistema público, llame a su servicio de agua o al Departamento de Salud del Estado de Washington, Oficina de Agua Potable, al número de teléfono (800) 521-0323 o visítenos en línea en: <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater.aspx>

Si tiene un pozo privado, llame al departamento de salud local. También puede encontrar información en **Pozos Privados: Información para los propietarios (331-349s)** una publicación disponible en Inglés y Español <https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm>

Para una lista de laboratorios certificados, visite en línea al Departamento de Ecología de Washington en: <http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp>. Bajo “Location” seleccione su estado, ciudad y condado. En la parte baja de la página haga click en “Show results.” Haga click en el nombre de un laboratorio para ver qué tipo de análisis hace. Llame al laboratorio para asegurarse que esté acreditado para hacer análisis de nitrato.

Si usted necesita esta publicación en un formato diferente, llame al 800-525-0127. Para TTY/TDD, llame al 800-833-6388.

# Nitrates, Blue Baby Syndrome, and Drinking Water: A fact sheet for families

## NITRATES, BLUE BABY SYNDROME, AND DRINKING WATER: A Factsheet for Families



### How to Keep Your Baby Safe from Nitrates in Drinking Water

Nitrates are chemicals that occur naturally in drinking water and also result from human activities, such as nitrogen fertilizer use, livestock operations (animal waste), and septic systems. In some locations, private wells are contaminated with nitrates. Excessive ingestion of nitrates can cause methemoglobinemia, which is also called "blue baby syndrome," in babies less than one year old. Blue baby syndrome can lead to a (temporary) change in an infant's skin to a bluish or brown color. This color change may also be noticed inside the nose or mouth, the lips, or the fingernail and toenail beds. This change in coloring may occur before the baby develops any symptoms, but it is important to contact a doctor immediately if you see these changes in your baby.

#### Tips to Reduce Exposure

- Use water from public water supplies, water that has been tested and approved, or bottled water.
- Test your well water for nitrates to ensure it is safe to drink. A nitrate test costs around \$50.
- Do not use nitrate-contaminated well water to make baby formula or to make baby food.
- Do not let your baby drink nitrate-contaminated water.
- If you are pregnant or trying to become pregnant, do not drink nitrate-contaminated well water.
- Breastfeeding is a safe practice even if the mother drinks water contaminated with nitrates.

#### What are the sources of nitrates in drinking water?

Nitrates are chemicals that occur naturally in water at low concentrations. They are also present due to human activities, such as the use of fertilizers and manure on irrigated farm fields that can run off and seep into wells. Nitrate-contaminated water can also be caused by improper management of human and animal waste (such as cow manure), leaky sewage pipes and septic system failures.

#### How are young babies exposed to nitrates?

Infants are exposed to nitrates when they drink contaminated well water, or when contaminated well water is used to make infant formula or baby food. Nitrates in water cannot pass through a baby's skin.

#### Are there other important sources of nitrates in addition to drinking water?

Nitrates can also be present in significant amounts in some vegetables, including spinach, beets, lettuce, cabbage, green beans, squash, carrots, and turnips. Because these vegetables may contain higher amounts of nitrates than other foods, avoid these food items until the baby is 7 months old. Doctors recommend that no solid foods be given to a baby before he/she is 4 - 6 months old.

#### How do nitrates harm young babies?

In the body, nitrates can be converted into nitrites. Nitrites change the iron in red blood cells from normal hemoglobin (which carries oxygen) to something called methemoglobin (which cannot carry oxygen). When there is too much methemoglobin, the body does not receive enough oxygen. Oxygen is needed everywhere in the body in order for cells and organs to function properly. Children older than 12 months and adults are less likely to be harmed by nitrates because they have a more fully developed ability to break down nitrates in the body. Some adults with doctor-identified digestive or genetic medical problems may also be sensitive to elevated nitrates in drinking water.

#### What health symptoms are expected when a baby is exposed to nitrates?

Nitrates can make a baby's skin turn brown or blue. This may be noticed inside the nose or mouth, the lips, or the fingernail and toenail beds. When a baby has consumed significant amounts of nitrates, the baby may become unusually fussy, tired and/or short of breath. Babies who have vomiting or diarrhea are at higher risk of developing symptoms when also exposed to excessive nitrates.

#### Is it safe to breast feed my baby?

Yes. Adults have more functional mechanisms to break down nitrates, so even if a mother drinks contaminated water, her breast milk is safe for her baby. Breast milk makes babies strong and healthy. Doctors recommend breast feeding.

#### Can nitrates harm the developing fetus?

Although the evidence is weak, nitrates may increase the risk of birth defects or spontaneous abortion. For this reason, women who are thinking about pregnancy or who are pregnant should avoid water contaminated with nitrates. Women considering pregnancy or who are pregnant should drink water from public water supplies, water that has been tested and has safe nitrate levels, or bottled water.

#### Why is it important to test my drinking water?

The only way to know if the nitrates in well water are at a safe level is to have the well water tested by a certified laboratory.

#### How do I test my drinking water for nitrates and how much will it cost?

All private wells should be tested before use and once per year for nitrates. Contact your state health department for assistance with selecting a certified laboratory. Generally the cost is around \$50, although prices will vary by region.

#### What does my nitrate drinking water test result mean?

The United States Environmental Protection Agency's (EPA) Maximum Contaminant Level (MCL) for nitrates is 10 mg/L (10 milligrams of nitrate in one liter of water) or 10 ppm (10 parts per million). The 10 mg/L standard was set to protect infants from nitrates. When a nitrate water test result is 10 mg/L or less, then the drinking water is considered safe with respect to nitrates.

Nitrates may change seasonally or randomly throughout the year. If the nitrate water test result is between 5 – 10 mg/L, test the well water every 3 months to confirm the water is still safe. When nitrates are present, pesticides or bacteria may also be present and additional water tests may be needed. Contact your local health department for guidance.

#### Resources

- For acute poisoning assistance, contact your state poison center at 1-800-222-1222.
- For clinical and public health assistance, contact your regional PEHSU office. To find your regional office, call 1-888-347-2632 or go to <http://www.aoc.org/PEHSU.htm>.

#### References

1. Nitrates, Methemoglobinemia and Drinking Water: A Fact Sheet for Clinicians. <http://depts.washington.edu/pehsu/sites/default/files/PEHSU%20Nitrates%20FactSheet-%20Provider%20July%202014.pdf>
2. Brender JD, et al. Prenatal nitrate intake from drinking water and selected birth defects in offspring of participants in the National Birth Defects Prevention Study. *Environ Health Perspect.* 2013;121:1083–1089.
3. Greer FR, Shannon M. Infant methemoglobinemia: the role of dietary nitrate in food and water. *Pediatrics.* 2005 Sep;116(3):784-6.
4. Hord NG, Tang Y, Bryan NS. Food sources of nitrates and nitrites: the physiologic context for potential health benefits. *Am J Clin Nutr.* 2009 Jul;90(1):1-10.
5. Rogan WJ et al. Drinking water from private wells and risks to children. *Pediatrics.* 2009 Jun;123(6):1599-605.
6. *Pediatric Environmental Health*, 3rd edition. American Academy of Pediatrics, 2012. pgs 471-478
7. EPA's website on Nitrates and Drinking Water at <http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm>

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## Nitrates, Methemoglobinemia, and Drinking Water: A fact sheet for clinicians

### NITRATES, METHEMOGLOBINEMIA, AND DRINKING WATER: A Factsheet for Clinicians



*Nitrates are chemicals that occur naturally in drinking water and also result from human activities. In some areas private wells are contaminated with nitrates. Excessive nitrates can cause acquired methemoglobinemia in young infants. This severe syndrome of inadequate tissue oxygenation is potentially fatal; prompt clinical recognition and treatment is vital. Families should be counseled on nitrate safety.*

#### Nitrate Background

- Nitrates and nitrites are naturally occurring inorganic nitrogen ions found in soil, water, and some foods. They are a natural part of the human diet. However, excessive consumption (e.g. drinking water or eating food from areas where ground water has become contaminated by excessive nitrate from fertilizers or improper manure management) can cause serious adverse health effects.

#### Nitrate Sources

- Drinking water
  - Nitrates occur naturally in water at low concentrations. Nitrates are also present as a result of human activities, such as the use of fertilizers and manure on irrigated farm fields that can run off and seep into wells. Nitrate-contaminated water can also be due to improper management of farm animal (i.e. cow) waste, leaky sewage pipes, and septic system failures.
  - Large suppliers of public water sources are required to monitor nitrate concentrations regularly, but private wells are not. In some areas private wells are contaminated with nitrates.
  - The American Academy of Pediatrics (AAP) consensus panel recommends that all prenatal and well-infant visits need to include questions about the home water supply.
  - The only way to know if the nitrate level in well water is at a safe level is to have the well water tested by a certified laboratory. All private wells should be tested before use and once per year for nitrates. Families should contact their state health department for assistance with selecting a certified laboratory.
  - Regulations and water testing frequency:
    - The United States Environmental Protection Agency's (EPA) Maximum Contaminant Level (MCL) for nitrates is 10 mg/L (or 10 parts per million, 10 ppm). The 10 mg/L standard was set to protect infants from nitrates. When a nitrate water test result is 10 mg/L or less, the water is considered safe for infant use.
    - Nitrates may change seasonally or randomly throughout the year. If the nitrate concentration is between 5 – 10 mg/L, monitor more closely and test the well drinking water every 3 months to confirm the water is still safe. When nitrates are present, pesticides or bacteria may also be present and additional water tests may be needed. Families should contact their local health department for guidance.
- Food
  - Nitrates can also be a problem in some vegetables, including spinach, beets, lettuce, cabbage, green beans, squash, carrots, and turnips. Because these vegetables may contain higher amounts of nitrates, recommend other foods until infants are over 6 months old.

#### Infant Nitrate Exposure

- Infants are exposed to nitrates when they drink contaminated well water or when contaminated well water is used to make infant formula or baby food.
- Nitrates in water are not significantly absorbed through the skin.
- Breastfeeding is safe even if a mother drinks water polluted with nitrates.

#### Methemoglobinemia and Other Health Effects

- Hemoglobin in blood contains iron normally found in the Fe<sup>2+</sup> (ferrous) state. Excessive nitrates or nitrites can alter the iron in hemoglobin to the Fe<sup>3+</sup> (ferric) state, forming methemoglobin (an abnormal form of hemoglobin



which cannot bind oxygen). Methemoglobinemia (an excess of methemoglobin) results in poor tissue oxygenation and anoxia.

- Methemoglobinemia, also known as “blue baby syndrome”, can be inherited or acquired. The acquired form, such as from excessive nitrate exposure, is a serious medical emergency. Among the reported cases of acquired methemoglobinemia in US infants, most have been attributed to the use of nitrate contaminated well water for preparation of infant formula.
- Infants less than 1 year old are physiologically vulnerable to the development of methemoglobinemia due to several factors:
  - Their higher gastric pH favors nitrate-reducing bacteria that convert ingested nitrate into methemoglobin-producing nitrite.
  - Fetal hemoglobin, the predominant form in infants up to 3 months of age, is oxidized more readily to methemoglobin by nitrite than is adult hemoglobin.
  - The activity of the red blood cell enzyme systems that reduce methemoglobin back to normal hemoglobin is reduced by about half in infants compared with adults.
  - Gastroenteritis can increase the risk of developing methemoglobinemia.
- **Women who are thinking about pregnancy or who are pregnant should avoid water contaminated with nitrates. Women considering pregnancy or who are pregnant should drink water from public water supplies, water that has been tested and has safe nitrate levels, or bottled water.** While not conclusive due to study limitations, epidemiological data suggest an association between maternal ingestion of nitrate from drinking water and preeclampsia, spontaneous abortion, intrauterine growth restriction, and various birth defects. A few studies have hinted at a role for childhood nitrate intake in the risk for later developing diabetes mellitus.

#### METHEMOGLOBINEMIA CLINICAL MANAGEMENT

##### Clinical presentation

- In children and adults with acute acquired methemoglobinemia, methemoglobin levels >20% are associated with clinical symptoms.
- Early methemoglobinemia symptoms include nonspecific headache, fatigue, dyspnea, and lethargy. In infants, this may present as unusual fussiness, decreased alertness, diarrhea, vomiting, shortness of breath, and increased work of breathing.
- At higher methemoglobin levels, cyanosis becomes visible. A brownish-blue skin tone may be present due to anoxia. This condition may be harder to detect in infants with dark skin- look for a bluish color of the nasal or oral mucosa, lips, or nail beds.
- Respiratory depression, altered consciousness, shock, seizures, and death may occur. Acquired methemoglobinemia is life threatening when methemoglobin comprises more than 30% of total hemoglobin and mortality rates are high when methemoglobin levels exceed 40%.

##### Diagnosis

- Initial diagnosis is based on history and exam findings. In addition, the presence of methemoglobin should be suspected with 1) clinical cyanosis despite normal arterial pO<sub>2</sub>, or 2) a significant difference between the oxygen saturations measured by pulse oximetry and by arterial blood gas analysis (“saturation gap”).
- A diagnosis of methemoglobinemia should be confirmed by laboratory analysis, to be done in the emergency setting (i.e. not in primary care). Hemoximetry, also called co-oximetry, is recommended way for measuring methemoglobin. Most current blood gas analyzers have incorporated the ability to do hemoximetry
- A fresh blood specimen (venous is fine) should always be obtained as methemoglobin levels tend to increase with storage.
- Note that routine pulse oximetry is inaccurate for monitoring oxygen saturation when methemoglobin is present, and should not be used for diagnosis.

##### Treatment

- Acute onset of acquired methemoglobinemia should be considered a medical emergency and requires immediate treatment in the ER setting.
- When the patient is symptomatic or the methemoglobin level is >20%, intravenous methylene blue (MB, dosed at 1 to 2 mg/kg over five minutes) can be life-saving and is considered the treatment of choice. Blood transfusion or

exchange transfusion may be helpful in patients who are in shock. See appropriate clinical guidelines for more detailed treatment and monitoring guidance.

#### Prevention and Advice for Families

- Only use water from public water supplies, water that has been tested and confirmed as safe, or bottled water.
- Test well water for nitrates to ensure it is safe to drink. A nitrate test is around \$50.
- Don't use nitrate-contaminated well water to make baby formula or to make baby food.
- Don't let infants drink nitrate-contaminated water.
- Women who are pregnant or trying to get pregnant should not drink nitrate-contaminated well water.
- Breastfeeding is safe even if the mother drinks water contaminated with nitrates.
- Because some vegetables may contain higher amounts of nitrates, choose other solid foods until infants are over 6 months old.

#### Reporting

- Methemoglobinemia is not currently a mandatory notifiable condition in Washington State. However new passive surveillance has been initiated by the Yakima Health District under the supervision of Health Officer Dr. Chris Spitters. Yakima Health District requests notification of laboratory-confirmed methemoglobinemia by calling (509) 249-6541 within three days of diagnosis. Please include an exposure history and your clinical impression regarding etiology, if known.

#### Resources and References

For acute poisoning assistance contact your state poison center at 1-800-222-1222.

For additional non-urgent clinical and public health assistance, contact the NW PEHSU. The University of Washington based Pediatric Environmental Health Specialty Unit (PEHSU) serves medical and public health professionals in Alaska, Washington, Idaho, and Oregon. For more information contact us at 1-877-543-2436 (1-877-KID-CHEM) or [pehsu@uw.edu](mailto:pehsu@uw.edu). Visit our website <http://www.depts.washington.edu/pehsu>.

- ATSDR ToxFAQs™ for Nitrates and Nitrites: <http://www.atsdr.cdc.gov/toxfaq/tf.asp?id=1186&tid=258>
- ATSDR Case Studies in Environmental Medicine (CSEM): Nitrate/Nitrite Toxicity (course: WB2342): <http://www.atsdr.cdc.gov/csem/csem.asp?csem=28&po=0>
- Brender JD, et al. Prenatal nitrate intake from drinking water and selected birth defects in offspring of participants in the National Birth Defects Prevention Study. *Environ Health Perspect.* 2013 121:1083 – 1089.
- Karr C. Children's Environmental Health in Agricultural Settings. *Journal of Agromedicine.* 2012 April; 17(2), 127-139.
- Greer FR, Shannon M. American Academy of Pediatrics Committee on Nutrition; American Academy of Pediatrics Council on Environmental Health. Infant methemoglobinemia: the role of dietary nitrate in food and water. *Pediatrics.* 2005 Sep;116(3):784-6.
- Hord NG, Tang Y, Bryan NS. Food sources of nitrates and nitrites: the physiologic context for potential health benefits. *Am J Clin Nutr.* 2009 Jul;90(1):1-10.
- Rogan WJ et al. Drinking Water from Private Wells and Risks to Children. *Pediatrics.* 2009 Jun;123(6):1599-605.
- Washington State Department of Health: Nitrate in Drinking Water WEB site. Last accessed March 31, 2014. <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/Contaminants/Nitrate.aspx>
- Yakima Health District Drinking Water WEB site last accessed March 31, 2014. [http://yakimacounty.us/yakimahealthdistrict/drinking\\_water.php](http://yakimacounty.us/yakimahealthdistrict/drinking_water.php)

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## How to Keep Your Baby Safe from Nitrates in Drinking Water

### **Groundwater Management Area (GWMA):**

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

Nitrates are chemicals that occur naturally in drinking water and also result from human activities. Some private wells in the Yakima Valley are contaminated with nitrates. Nitrates can cause babies less than one year old to become sick. A symptom of nitrate exposure is your baby's skin turning brown or blue. You might see this inside the nose or mouth, the lips, or the fingernail and toenail beds. Contact a doctor immediately if you see these changes in a baby.

#### **Tips to Reduce Exposure**

- Test your well water for nitrates and bacteria to ensure it is safe to drink for your baby. Information on testing well water is offered below.
- Do not use nitrate-contaminated well water to make baby formula.
- Do not let baby drink nitrate-contaminated water.
- If you have city water it should be safe to use for baby, or use well water that has been tested and is safe, or bottled water for baby.
- Nitrates can be a problem in some vegetables. Try to choose commercially prepared vegetable baby foods until the baby is 7 months old. Doctors recommend no solid foods before 4-6 months old.
- If you are pregnant, or plan to get pregnant, do not drink nitrate-contaminated well water
- Breast milk is safe for baby even if the mother drinks water contaminated with nitrates.

**Children over one year old** have the ability to break down nitrates so they're not at risk. To keep babies safe, women who are pregnant or thinking of getting pregnant should not drink water with elevated nitrates.

**Test your drinking water.** All private wells should be tested before use and once per year for nitrates and bacteria. Nitrate concentrations change randomly throughout the year in the Yakima Valley. If nitrates are present in well water, other contaminants may also be present such as pesticides or bacteria.

Certified laboratories in the Yakima area that will test well drinking water for nitrates and bacteria:

- Cascade Analytical, Inc., 1008 W. Ahtanum, Yakima, WA 98903, (509) 452-7707
- Valley Environmental Laboratory, 201 E. "D" St., Yakima, WA 98901, (509) 575-3999
- Ag Health Laboratories, 445 Barnard Blvd, Sunnyside, WA 98944, (509) 836-2020

The total cost for nitrates and bacteria tests is between \$52 and \$70. Follow the directions provided by the laboratory – this is important to get good test results.

If a nitrate water test result is 10 mg/L or less the drinking water is safe. This means the water is safe for infants to drink and the water can be used to make formula for infants. The water is also safe for women who are pregnant or thinking about getting pregnant.

For more information about nitrates contact: Yakima Health District Help Line at (509)249-6508.

For clinician diagnosis and treatment guidance or other health effects: University of Washington (UW) PEHSU (Pediatric Environmental Health Specialty Unit) at 1-800-543-2436.

For more children's health information: [www.epa.gov/children](http://www.epa.gov/children) and

ATSDR at <http://www.atsdr.cdc.gov/csem/csem.asp?csem=28&po=0>  
Benton County: Benton Franklin Health District (509) 460-4200

Yakima Nation: Indian Health Services - Environmental Health (509) 865-1776

Map: [http://www.yakimacounty.us/gwma/documents/GWMA\\_Boundary.pdf](http://www.yakimacounty.us/gwma/documents/GWMA_Boundary.pdf)



## How to Keep Your Baby Safe from Nitrates in Drinking Water (Spanish)



# Cómo Mantener Seguro a su Bebé de los Nitratos en el Agua Potable

### Área de Manejo de Agua Subterránea (GWMA):

*El propósito de GWMA es reducir la concentración de contaminación por nitrato en el agua subterránea a niveles por debajo de los estándares del estado para el agua potable.*

Los nitratos son químicos que se dan de manera natural en el agua potable pero también pueden ser el resultado de las actividades humanas. Algunos pozos privados en el Valle de Yakima están contaminados con nitratos. Los nitratos pueden causar que se enfermen los bebés menores de un año de edad. Un síntoma de exposición a nitrato es la piel de su bebé cambia de color café o azul. Es posible que vea esto dentro de la boca y la nariz, los labios o en las uñas de las manos y de los pies. Si ve estos cambios de coloración en su bebé, comuníquese inmediatamente con su doctor.

#### Recomendaciones para reducir la exposición

- Haga la prueba por nitratos y bacteria al agua de su pozo para asegurar que es segura que su bebé la beba. En este folleto encontrará información para la prueba al agua de su pozo.
- No utilice agua de pozo contaminada con nitratos para preparar la fórmula del bebé.
- No permita que su bebé beba agua contaminada con nitratos.
- Si Ud. recibe agua de la ciudad debe ser seguro de usar para el bebé. Para el bebé sólo use agua de pozo que ha sido probado y es segura o use agua embotellada.
- Los nitratos pueden ser un problema para algunas verduras. Escoja alimentos para bebés con verduras preparadas comercialmente hasta que su bebé tenga 7 meses de edad. Los doctores no recomiendan que los bebés coman alimentos sólidos antes de tener de 4 a 6 meses de edad.
- Si usted está embarazada o planea quedarse embarazada, no beba agua de pozo contaminada con nitratos.
- La leche materna es segura para el bebé aun cuando la madre beba agua contaminada con nitratos.

Los niños mayores de un año de edad tienen la capacidad de descomponer los nitratos y por lo tanto no están en riesgo. Para mantener seguros a los bebés, las mujeres embarazadas o las que planean quedarse embarazadas no deben beber agua con niveles altos de nitratos.

**Haga la prueba a su agua para beber.** A todos los pozos privados se les debería hacer la prueba por nitratos y bacteria antes de usarlos y una vez al año después. En el Valle de Yakima, la concentración de nitrato varía durante el año. Si en el agua de su pozo hay nitratos presentes, también pudiera haber presentes otros contaminantes como pesticidas o bacteria.

Los laboratorios certificados en el área de Yakima que realizan la prueba para nitratos y bacteria al agua de pozo son:

- Cascade Analytical, Inc., 1008 W. Ahtanum, Yakima, WA 98903, (509) 452-7707
- Valley Environmental Laboratory, 201 E. "D" St., Yakima, WA 98901, (509) 575-3999
- Ag Health Laboratories, 445 Barnard Blvd, Sunnyside, WA 98944, (509) 836-2020

El costo total de las pruebas por nitrato y bacteria es entre \$52 a \$70 dólares. Siga las instrucciones proveídas por el laboratorio seleccionado. Esto es especialmente importante para obtener buenos resultados en la prueba.

Si el resultado de la prueba por nitrato es de 10 mg/L o menos, el agua es segura para beber. Esto significa que el agua es segura para que la beban los bebés y para utilizar en preparar la fórmula del bebé. Este nivel también indica que el agua es segura para mujeres embarazadas o aquellas que piensan quedarse embarazadas.

Para más información acerca de los nitratos comuníquese a:  
línea de asistencia de Yakima Health District (509)249-6508.

Para diagnóstico clínico y guía de tratamiento u otro efecto en la salud:  
University of Washington (UW) PEHSU (Pediatric Environmental Health Specialty Unit) al 1-800-543-2436.

Más información sobre la salud de los bebés: [www.epa.gov/children](http://www.epa.gov/children) y  
ATSDR <http://www.atsdr.cdc.gov/csem/csem.asp?csem=28&po=0>

Benton County: Benton Franklin Health District (509) 460-4200

Yakima Nation: Indian Health Services - Environmental Health (509) 865-1776  
Mapa: [http://www.yakimacounty.us/gwma/documents/GWMA\\_Boundary.pdf](http://www.yakimacounty.us/gwma/documents/GWMA_Boundary.pdf)

## PEHSU Nitrates Clinician Fact Sheet

### NITRATES, METHEMOGLOBINEMIA, AND DRINKING WATER: A Factsheet for Clinicians



*Nitrates are chemicals that occur naturally in drinking water and also result from human activities. In some areas private wells are contaminated with nitrates. Excessive nitrates can cause acquired methemoglobinemia in young infants. This severe syndrome of inadequate tissue oxygenation is potentially fatal; prompt clinical recognition and treatment is vital. Families should be counseled on nitrate safety.*

#### Nitrate Background

- Nitrates and nitrites are naturally occurring inorganic nitrogen ions found in soil, water, and some foods. They are a natural part of the human diet. However, excessive consumption (e.g. drinking water or eating food from areas where ground water has become contaminated by excessive nitrate from fertilizers or improper manure management) can cause serious adverse health effects.

#### Nitrate Sources

- Drinking water
  - Nitrates occur naturally in water at low concentrations. Nitrates are also present as a result of human activities, such as the use of fertilizers and manure on irrigated farm fields that can run off and seep into wells. Nitrate-contaminated water can also be due to improper management of farm animal (i.e. cow) waste, leaky sewage pipes, and septic system failures.
  - Large suppliers of public water sources are required to monitor nitrate concentrations regularly, but private wells are not. In some areas private wells are contaminated with nitrates.
  - The American Academy of Pediatrics (AAP) consensus panel recommends that all prenatal and well-infant visits need to include questions about the home water supply.
  - The only way to know if the nitrate level in well water is at a safe level is to have the well water tested by a certified laboratory. All private wells should be tested before use and once per year for nitrates. Families should contact their state health department for assistance with selecting a certified laboratory.
  - Regulations and water testing frequency:
    - The United States Environmental Protection Agency's (EPA) Maximum Contaminant Level (MCL) for nitrates is 10 mg/L (or 10 parts per million, 10 ppm). The 10 mg/L standard was set to protect infants from nitrates. When a nitrate water test result is 10 mg/L or less, the water is considered safe for infant use.
    - Nitrates may change seasonally or randomly throughout the year. If the nitrate concentration is between 5 – 10 mg/L, monitor more closely and test the well drinking water every 3 months to confirm the water is still safe. When nitrates are present, pesticides or bacteria may also be present and additional water tests may be needed. Families should contact their local health department for guidance.
- Food
  - Nitrates can also be a problem in some vegetables, including spinach, beets, lettuce, cabbage, green beans, squash, carrots, and turnips. Because these vegetables may contain higher amounts of nitrates, recommend other foods until infants are over 6 months old.

#### Infant Nitrate Exposure

- Infants are exposed to nitrates when they drink contaminated well water or when contaminated well water is used to make infant formula or baby food.
- Nitrates in water are not significantly absorbed through the skin.
- Breastfeeding is safe even if a mother drinks water polluted with nitrates.

#### Methemoglobinemia and Other Health Effects

- Hemoglobin in blood contains iron normally found in the Fe<sup>2+</sup> (ferrous) state. Excessive nitrates or nitrites can alter the iron in hemoglobin to the Fe<sup>3+</sup> (ferric) state, forming methemoglobin (an abnormal form of hemoglobin

which cannot bind oxygen). Methemoglobinemia (an excess of methemoglobin) results in poor tissue oxygenation and anoxia.

- Methemoglobinemia, also known as “blue baby syndrome”, can be inherited or acquired. The acquired form, such as from excessive nitrate exposure, is a serious medical emergency. Among the reported cases of acquired methemoglobinemia in US infants, most have been attributed to the use of nitrate contaminated well water for preparation of infant formula.
- Infants less than 1 year old are physiologically vulnerable to the development of methemoglobinemia due to several factors:
  - Their higher gastric pH favors nitrate-reducing bacteria that convert ingested nitrate into methemoglobin-producing nitrite.
  - Fetal hemoglobin, the predominant form in infants up to 3 months of age, is oxidized more readily to methemoglobin by nitrite than is adult hemoglobin.
  - The activity of the red blood cell enzyme systems that reduce methemoglobin back to normal hemoglobin is reduced by about half in infants compared with adults.
  - Gastroenteritis can increase the risk of developing methemoglobinemia.
- **Women who are thinking about pregnancy or who are pregnant should avoid water contaminated with nitrates. Women considering pregnancy or who are pregnant should drink water from public water supplies, water that has been tested and has safe nitrate levels, or bottled water.** While not conclusive due to study limitations, epidemiological data suggest an association between maternal ingestion of nitrate from drinking water and preeclampsia, spontaneous abortion, intrauterine growth restriction, and various birth defects. A few studies have hinted at a role for childhood nitrate intake in the risk for later developing diabetes mellitus.

#### METHEMOGLOBINEMIA CLINICAL MANAGEMENT

##### Clinical presentation

- In children and adults with acute acquired methemoglobinemia, methemoglobin levels >20% are associated with clinical symptoms.
- Early methemoglobinemia symptoms include nonspecific headache, fatigue, dyspnea, and lethargy. In infants, this may present as unusual fussiness, decreased alertness, diarrhea, vomiting, shortness of breath, and increased work of breathing.
- At higher methemoglobin levels, cyanosis becomes visible. A brownish-blue skin tone may be present due to anoxia. This condition may be harder to detect in infants with dark skin- look for a bluish color of the nasal or oral mucosa, lips, or nail beds.
- Respiratory depression, altered consciousness, shock, seizures, and death may occur. Acquired methemoglobinemia is life threatening when methemoglobin comprises more than 30% of total hemoglobin and mortality rates are high when methemoglobin levels exceed 40%.

##### Diagnosis

- Initial diagnosis is based on history and exam findings. In addition, the presence of methemoglobin should be suspected with 1) clinical cyanosis despite normal arterial pO<sub>2</sub>, or 2) a significant difference between the oxygen saturations measured by pulse oximetry and by arterial blood gas analysis (“saturation gap”).
- A diagnosis of methemoglobinemia should be confirmed by laboratory analysis, to be done in the emergency setting (i.e. not in primary care). Hemoximetry, also called co-oximetry, is recommended way for measuring methemoglobin. Most current blood gas analyzers have incorporated the ability to do hemoximetry
- A fresh blood specimen (venous is fine) should always be obtained as methemoglobin levels tend to increase with storage.
- Note that routine pulse oximetry is inaccurate for monitoring oxygen saturation when methemoglobin is present, and should not be used for diagnosis.

##### Treatment

- Acute onset of acquired methemoglobinemia should be considered a medical emergency and requires immediate treatment in the ER setting.
- When the patient is symptomatic or the methemoglobin level is >20%, intravenous methylene blue (MB, dosed at 1 to 2 mg/kg over five minutes) can be life-saving and is considered the treatment of choice. Blood transfusion or



exchange transfusion may be helpful in patients who are in shock. See appropriate clinical guidelines for more detailed treatment and monitoring guidance.

#### Prevention and Advice for Families

- **Only use water from public water supplies, water that has been tested and confirmed as safe, or bottled water.**
- **Test well water for nitrates to ensure it is safe to drink. A nitrate test is around \$50.**
- **Don't use nitrate-contaminated well water to make baby formula or to make baby food.**
- **Don't let infants drink nitrate-contaminated water.**
- **Women who are pregnant or trying to get pregnant should not drink nitrate-contaminated well water.**
- **Breastfeeding is safe even if the mother drinks water contaminated with nitrates.**
- **Because some vegetables may contain higher amounts of nitrates, choose other solid foods until infants are over 6 months old.**

#### Reporting

- Methemoglobinemia is not currently a mandatory notifiable condition in Washington State. However new passive surveillance has been initiated by the Yakima Health District under the supervision of Health Officer Dr. Chris Spitters. Yakima Health District requests notification of laboratory-confirmed methemoglobinemia by calling (509) 249-6541 within three days of diagnosis. Please include an exposure history and your clinical impression regarding etiology, if known.

#### Resources and References

For acute poisoning assistance contact your state poison center at 1-800-222-1222.

For additional non-urgent clinical and public health assistance, contact the NW PEHSU. The University of Washington based Pediatric Environmental Health Specialty Unit (PEHSU) serves medical and public health professionals in Alaska, Washington, Idaho, and Oregon. For more information contact us at 1-877-543-2436 (1-877-KID-CHEM) or [pehsu@uw.edu](mailto:pehsu@uw.edu). Visit our website <http://www.depts.washington.edu/pehsu>.

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- ATSDR Case Studies in Environmental Medicine (CSEM): Nitrate/Nitrite Toxicity (course: WB2342): <http://www.atsdr.cdc.gov/csem/csem.asp?csem=28&po=0>
- Brender JD, et al. Prenatal nitrate intake from drinking water and selected birth defects in offspring of participants in the National Birth Defects Prevention Study. *Environ Health Perspect.* 2013 121:1083 – 1089.
- Karr C. Children's Environmental Health in Agricultural Settings. *Journal of Agromedicine.* 2012 April; 17(2), 127-139.
- Greer FR, Shannon M. American Academy of Pediatrics Committee on Nutrition; American Academy of Pediatrics Council on Environmental Health. Infant methemoglobinemia: the role of dietary nitrate in food and water. *Pediatrics.* 2005 Sep;116(3):784-6.
- Hord NG, Tang Y, Bryan NS. Food sources of nitrates and nitrites: the physiologic context for potential health benefits. *Am J Clin Nutr.* 2009 Jul;90(1):1-10.
- Rogan WJ et al. Drinking Water from Private Wells and Risks to Children. *Pediatrics.* 2009 Jun;123(6):1599-605.
- Washington State Department of Health: Nitrate in Drinking Water WEB site. Last accessed March 31, 2014. <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/Contaminants/Nitrate.aspx>
- Yakima Health District Drinking Water WEB site last accessed March 31, 2014. [http://yakimacounty.us/yakimahealthdistrict/drinking\\_water.php](http://yakimacounty.us/yakimahealthdistrict/drinking_water.php)

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## Section 5: Phase I Well Testing

The GWAC partnered with the Yakima Health District to offer free nitrate and coliform sampling to private (and shared) well owners in two phases between 2014 and 2017. The purpose was to help residents learn more about water quality and about how the area's drinking water could impact local public health. More than 460 households participated. The EPO employed bilingual direct mail, letters to the editors of local newspapers, English and Spanish radio talk shows, PSAs, and news releases to solicit participation.

## High-Risk Well Testing: Media Talking Points

### **Results of the 2014 Free Well Testing**

**Offered by the Lower Yakima Valley Groundwater Advisory Committee (GWAC)**  
Lower Yakima Valley Groundwater Management Area (GWMA)

#### **Background**

- The Lower Yakima Valley Groundwater Management Area (GWMA) was formed in 2011 to address nitrate contamination in groundwater.
- The GWMA is a response to elevated nitrate levels found in the lower Yakima Valley.
- The GWMA boundaries extend west from Union Gap east to County Line Road, minus the Yakama Nation. (273.7 mi.<sup>2</sup>)
- Its goal is to reduce nitrate in groundwater to below state drinking water standards (below 10 mg/L).
- The GWAC is a multi-agency and citizen-based group with 21 primary members and alternates. It is responsible for developing the GWMA Program.
- The GWMA Program will be a comprehensive program designed to protect groundwater quality in the Lower Yakima Valley.

#### **Why was the well testing conducted?**

- To help private well owners learn about the health of their drinking water and how to protect themselves against possible contamination.
- To remind well owners to test their well at least once a year.
- To spread the word about the GWAC's work and the LYV Groundwater Management Area.

#### **What did you test for?**

Nitrate and coliform.

#### **Who participated?**

- Households on private or shared wells in the Lower Yakima Valley GWMA were invited to participate.

**How many wells were tested?**

172 private and shared wells

**What did you learn?****Of the 172 wells tested:**

- 59% (101) had little or no nitrates (0-4.99 mg/L)
- 25% (43) had moderate (still acceptable) amounts of nitrate (5.0-9.99 mg/L)
- 16% (28) had nitrates at or above 10 mg/L

**What will you do with this information?**

While the sample size is too small to draw meaningful conclusions, we did learn we have a lot of work ahead of us:

- Many people don't know that they should test their wells regularly.
- They don't know who is at risk from elevated nitrates for how to protect themselves.

We will use these results to help educate well owners and to prepare for the next round of the free well testing, which we expect to conduct later this year.

**Is there anything else you'd like to add?**

Yes. If you missed out on our free well testing, we will be offering it again soon. Please call 509-574-2300 to sign up for this year's free testing.



## Phase I High-Risk Survey Instrument



Form #GWMA0002 A  
Revised 10/16/2013

### Assessment Of Health Risk - Water Supply Well - Lower Yakima Valley (GWMA 2013)

☐ Survey Completed    ☐ Survey Attempted/Not Completed:  
☐ No One Home    ☐ Declined    ☐ Other    \_\_\_\_\_ Number of Attempts

Date Survey Completed \_\_\_\_\_  
Parcel # \_\_\_\_\_ Surveyor \_\_\_\_\_  
Name Of Person Surveyed \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Email \_\_\_\_\_  
Home Phone \_\_\_\_\_ Cell Phone \_\_\_\_\_

Answers to the following questions will help assess the potential health risk for private well owners. Specifically, those risks associated with high levels of nitrate in their well. A potential High Public Health Risk (HPHR) is identified with a yellow highlight and a heavy border around the checkbox. A potential Public Health Risk (PHR) is only identified with a yellow highlight in the checkbox. . Water supply wells found with a potential HPHR will be given recommendations for testing, repairs, or maintenance of their well.

As a general rule the Washington Departments of Health and Ecology recommend private groundwater wells be tested for nitrate every three years and bacteria every year.

Classify the surrounding area as	<input type="checkbox"/> Farm	<input type="checkbox"/> Rural	<input type="checkbox"/> Rural Community Sub-Division	<input type="checkbox"/> Suburb	
Does the home have a treatment system installed?	<input type="checkbox"/> Yes		<input type="checkbox"/> No		
If yes what kind?	<input type="checkbox"/> POU	<input type="checkbox"/> POE	<input type="checkbox"/> Ion Exchange (Water Softener)	<input type="checkbox"/> Other	
Does the home have bottled water?	<input type="checkbox"/> Yes		<input type="checkbox"/> No		
Sample Scheduled or Taken?	<input type="checkbox"/> Nitrate	<input type="checkbox"/> Nitrate Test Strip	<input type="checkbox"/> Coliform	<input type="checkbox"/> Other	
GPS Coordinates	X: _____		Y: _____		
<p><b>High Risk:</b> (80% of PHR and HPHR boxes checked) Possible contamination of the water supply and for the long term may need testing, improvements, repairs, or replacement. You should test your water immediately. If tests are positive for Fecal or E.Coli bacteria or have a nitrate level higher than 10 mg/L, you should consider using an alternative source of drinking water for daily uses, until the observed risk(s) can be corrected. If you believe you or your family is experiencing health effects associated with your drinking water, you should discuss the test results with your health care provider.</p> <p><b>Moderate Risk:</b> (60% of PHR and HPHR boxes checked) Your well may be a potential health threat to anyone consuming the water and may be susceptible to contamination. Recommend regular maintenance of the well and frequent water tests for nitrate and coliform bacteria.</p> <p><b>Low Risk:</b> Recommend regular maintenance of the well and water tests for nitrate and coliform bacteria.</p>	<b>Section Summary</b>		<b>Boxes Checked</b>		
	<b>1</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No			
	<b>2</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No			
	<b>3</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No			
	<b>4</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No			
	<b>Total</b>	Yes: _____ No: _____			
<input type="checkbox"/> High		<input type="checkbox"/> Moderate	<input type="checkbox"/> Low		
<b>Section 1: General Population Questions</b>		<b>Yes</b>	<b>No</b>	<b>Unk</b>	<b>Comments</b>
<b>1. How many residents live in your household?</b>					

**Assessment Of Health Risk - Water Supply Well - Lower Yakima Valley (GWMA 2013)**

2. Are there very young children less than 1-yr old in your household?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Are there pregnant women in your household?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Women who can possibly become pregnant in your household?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Are there chronically ill people in your household?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Would you be willing to provide your household income?				
7. What is the primary language spoken in your home?				
Total High Risk Boxes Checked: <input type="checkbox"/>	At Risk Population:		Yes: <input type="checkbox"/>	No: <input type="checkbox"/>
<b>Section 2: General Water Quality Questions</b>				
	Yes	No	Unk	Comments
8. Has the well been tested for Total Coliform (Bacteria)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
a. Answered yes to previous question, was the sample positive for Total Coliform?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Answered yes to previous question, was the sample positive for Fecal or E. Coli?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Has the well been tested for nitrate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
a. Answered yes to previous question (9), was the sample lower than 5.0 mg/L?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Answered no to previous question (9a), was the sample higher than 10.0 mg/L?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10. Does the well water have an unusual taste, odor, or color?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Total High Risk Boxes Checked: <input type="checkbox"/>	Potential Public Health Risk(s):		Yes: <input type="checkbox"/>	No: <input type="checkbox"/>
<b>Section 3: Sanitary Control Area Risk Factors</b>				
	Yes	No	Unk	Comments
11. Does the owner live on a small lot with an onsite septic system (less than 1-acre)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
a. Is the well within 50 ft of a septic tank or 100 ft of a drainfield?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b. Have you had your septic tank pumped recently?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c. Do neighbors live on small lots with onsite septic systems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12. Is there surface water within 100 feet of the well? ( like ponds, lagoons, rivers, unlined irrigation ditches )	<input type="checkbox"/>	<input type="checkbox"/>		Surface Water Type
a. Is there surface water within 200 feet of the well?	<input type="checkbox"/>	<input type="checkbox"/>		Surface Water Type
13. Do you use the area surrounding the well as a pasture or have structures to house personal animals?	<input type="checkbox"/>	<input type="checkbox"/>		Type: _____ How Many: _____
a. Does your neighbor use the area surrounding the well as a pasture or have structures for housing personal animals?	<input type="checkbox"/>	<input type="checkbox"/>		Type: _____ How Many: _____
14. Do you see large mounds of manure near your well, within 100-ft?	<input type="checkbox"/>	<input type="checkbox"/>		Owner: _____ Neighbors: _____
a. Do you see large mounds of manure near your well, within 200-ft?	<input type="checkbox"/>	<input type="checkbox"/>		Owner: _____ Neighbors: _____
15. Have you seen manure spreading near your well, within 100-ft?	<input type="checkbox"/>	<input type="checkbox"/>		How Often: _____
a. Have you seen manure spreading near your well, within 200-ft?	<input type="checkbox"/>	<input type="checkbox"/>		How Often: _____
16. Is your well located within 100-ft of any type of agricultural field or orchard?	<input type="checkbox"/>	<input type="checkbox"/>		Crop: _____ Distance: _____
a. Is your well located within 200-ft of any type of agricultural field or orchard?	<input type="checkbox"/>	<input type="checkbox"/>		Crop: _____ Distance: _____

**Assessment Of Health Risk - Water Supply Well - Lower Yakima Valley (GWMA 2013)**

17. Have you sprayed or seen sprayed any chemicals within 100-ft of your well?	<input type="checkbox"/>	<input type="checkbox"/>	How Often: _____ How Close: _____
a. Have you sprayed or seen sprayed any chemicals within 200-ft of your well?	<input type="checkbox"/>	<input type="checkbox"/>	How Often: _____ How Close: _____
Total High Risk Boxes Checked: <span style="background-color: yellow;">      </span>	Well Susceptible to Surface Contamination:		Yes: <input type="checkbox"/> No: <input type="checkbox"/>
<b>Section 4: Well Construction</b>	<b>Yes</b>	<b>No</b>	<b>Unk</b> <b>Comments</b>
18. Do you have a copy of the well log?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> _____-yr
19. Do you know how old your well is?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Do you know the depth of your well?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> _____-ft
21. Is it a hand dug well?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Is it a driven well (sand point)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Does the well appear poorly maintained (condition of wellhead or pump house)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Does the well appear to have a broken wellhead seal or holes in the casing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Is the wellhead subject to flooding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total High Risk Boxes Checked: <span style="background-color: yellow;">      </span>	Well Vulnerable to Surface Contamination:		Yes: <input type="checkbox"/> No: <input type="checkbox"/>

**Section 5: Long Term Monitoring Consideration**

26. Type of Well:	<input type="checkbox"/> Domestic	<input type="checkbox"/> Public Supply	<input type="checkbox"/> Industrial	<input type="checkbox"/> Irrigation
27. Describe Wellhead Completion (pitless adapter, wellhouse, etc.): _____				
28. Record the Ecology UWID if tagged on the wellhead or noted on the well log: _____				
29. GPS Latitude of the Wellhead (valid coordinates must be positive and from 45-47, must be a minimum of 4 decimal places): _____				
30. GPS Longitude of the Wellhead (valid coordinates must be negative and from -119 to -121, must be a minimum of 4 decimal places): _____				
31. Depth to Water (ft below Measuring Point, MP): _____				
a. MP Description: _____				
b. DTW Method Description (e.g. well log, measured, etc.): _____				
32. Is Type of Pump Known?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown	
a. Pump Is (e.g. Submersible, Suction-lift, Jet pump, Line Shaft Turbine): _____				
33. Is Sampling Port available downstream (before water enters) treatment system, holding tanks, or pressure tanks?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown	
a. Description of sampling port (location, type): _____				

**Assessment Of Health Risk - Water Supply Well - Lower Yakima Valley (GWMA 2013)**

<b>34. Is Participant interested in having their well considered for Long-Term Monitoring?</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
<b>a. Directions for gaining access to the site (notification request, allowed if owner/resident not present, etc.):</b>			
<b>b. Special tools or materials to access/open sampling port or to manage purge water:</b>			
<b>c. Safety considerations for samplers (e.g. domestic animals, rodents):</b>			

**Section 5: Graphics (Required)**

**Site Sketches and Photos: Must include sufficient detail and scale to enable field personnel unfamiliar with the site to readily locate the well from the driveway or street. Include land cover/use features from Section 3 (septic, agriculture, etc.). Compass directions and horizontal scale required.**

<b>a. Site Sketch is on additional page(s) attached to this Survey form:</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>b. Digital Photos of the site taken (if camera does not have GPS capabilities, first photo in series at individual site must clearly document Site ID):</b>	<input type="checkbox"/> Yes	<input type="checkbox"/> No

**Assessment Of Health Risk - Water Supply Well - Lower Yakima Valley (GWMA 2013)**

**Wellhead Sketches and Photos: Must include sufficient detail and scale to enable field personnel unfamiliar with the well to readily locate the sampling port and water level measuring point if applicable.**

a. Wellhead Sketch is on additional page(s) attached to this Survey form:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Digital Photos of the wellhead taken (if camera does not have GPS capabilities, first photo in series at individual site must clearly document Site ID):	<input type="checkbox"/> Yes	<input type="checkbox"/> No



**Assessment Of Health Risk - Water Supply Well - Lower Yakima Valley (GWMA 2013)**

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## Well Assessment Survey Test Results

Through February 15, 2016

### Nitrate Test Results

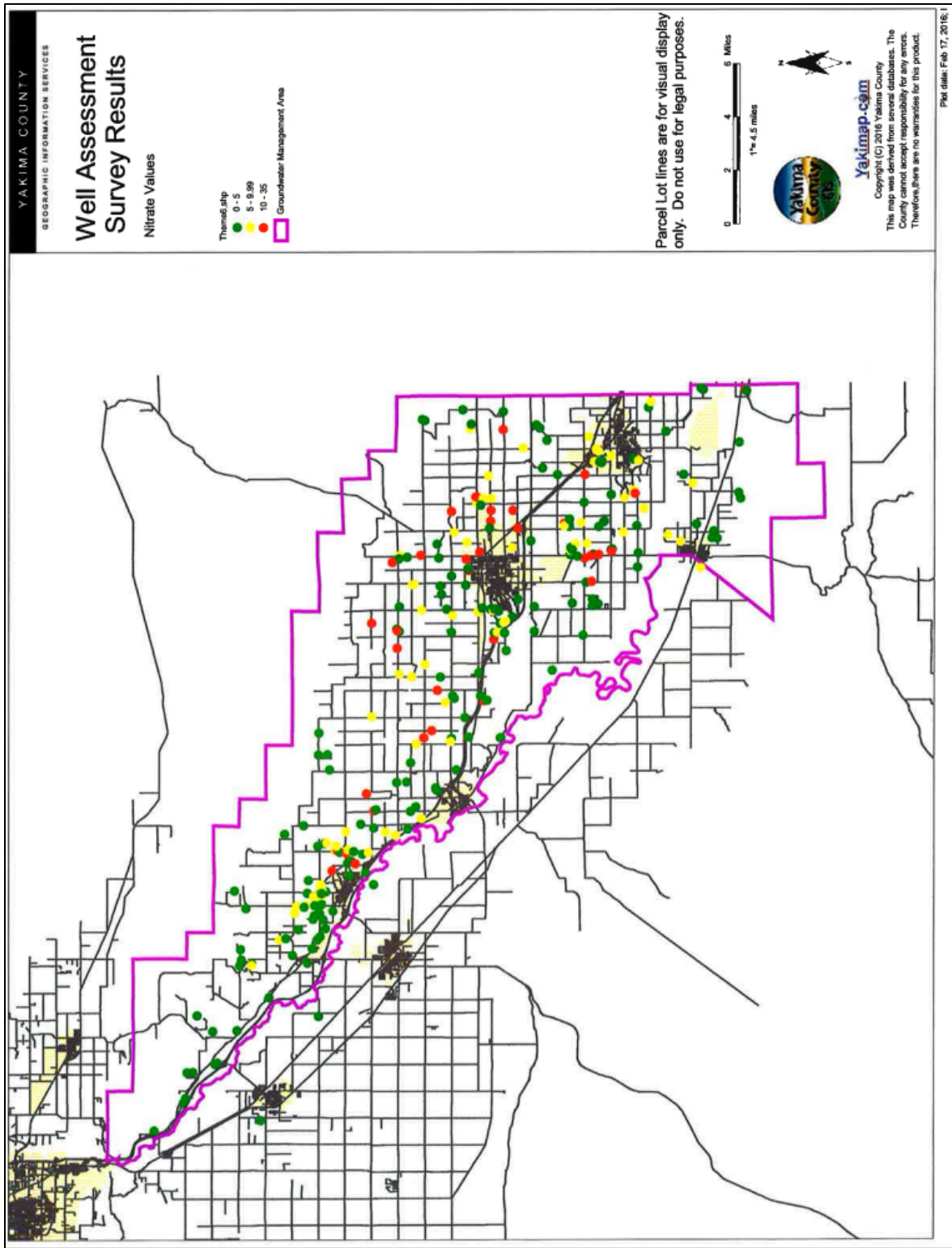
Nitrate Range	Number of Wells	Percent
0 to 5.0	172	60%
5.01 to 9.99	76	26%
10.0 to 35	40	14%
Grand Total	288	100%

### Bacteria Test Results

Result	Number of Wells		
	Bacteria Present	Ecoli Present	Fecal Present
Satisfactory	228	286	288
Unsatisfactory	60	2	0
Grand Total	288	288	288

### Nitrate and Bacteria Test Results

Nitrate Range	Number of Wells	Bacteria Present	Ecoli Present	Fecal Present
0 to 5.0	172	40	2	0
5.01 to 9.99	76	14	0	0
10.0 to 35	40	6	0	0
Grand Total	288	60	2	0



### High Risk Well Assessment Letters-Variables

Where:

Nitrate Results Are	And Results Are	Coliform	And	Letter is
N is 0-4.9 mg/L	Satisfactory		N/A	Letter #1
N is 0-4.9 mg/L	Unsatisfactory		N/A	Letter #1 with coliform variation
N is 5-9.9 mg/L	Satisfactory		N/A	Letter #2
N is 5-9.9 mg/L	Unsatisfactory		N/A	Letter #2 with coliform variation
N is 10 mg/L or greater	Satisfactory		N/A	Letter #3
N is 10 mg/L or greater	Unsatisfactory		E-Coli Not present	Letter #3 with coliform variation
N is ???	Unsatisfactory		E-Coli Present	Letter #?? With disinfect message

# of pages	Letter #1 Enclosures	Letter #2 enclosures	Letter #3 enclosures
1 (single)	Lab results	Lab results	Lab results
1 (single)	2A_Certified Lab List (English/Spanish)	2A_Certified Lab List (English/Spanish)	2A_Certified Lab List (English/Spanish)
1 (double)	2B_DOH Coliform 331-79 Q&A	2B_DOH Coliform 331-79 Q&A	2B_DOH Coliform 331-79 Q&A
1 (double)	2B_(Sp) DOH Coliform 331-79 Q&A	2B_(Sp) DOH Coliform 331-79 Q&A	2B_(Sp) DOH Coliform 331-79 Q&A
1 (double)	2C_DOH Nitrate in Drinking Water 331-214	2C_DOH Nitrate in Drinking Water 331-214	2C_DOH Nitrate in Drinking Water 331-214
1 (double)	2C_(Sp) DOH Nitrate in Drinking Water 331-214	2C_(Sp) DOH Nitrate in Drinking Water 331-214	2C_(Sp) DOH Nitrate in Drinking Water 331-214
			Emergency disinfect

## Well Assessment Survey (July 13, 2015)

### High Risk Well Assessment

Section 1 - General Information									
<b>Parcel #:</b>	<input style="width: 90%;" type="text"/>	<b>Date:</b>	<input style="width: 90%;" type="text"/>	<b>Surveyor Name:</b>	<input style="width: 95%;" type="text"/>				
<b>Address:</b>	<input style="width: 90%;" type="text"/>	<b>Apt. #</b>	<input style="width: 90%;" type="text"/>	<b>Resident Name:</b>	<input style="width: 95%;" type="text"/>				
<b>GPS:</b>	<b>Street</b>	<input style="width: 90%;" type="text"/>	<b>City</b>	<input style="width: 90%;" type="text"/>	<b>Resident Type:</b>	<input type="checkbox"/> Resident	<input type="checkbox"/> Owner	<input type="checkbox"/> Both	
	<b>State</b>	<input style="width: 90%;" type="text"/>	<b>Zip</b>	<input style="width: 90%;" type="text"/>	<b>Primary Phone:</b>	<input style="width: 90%;" type="text"/>	<input type="checkbox"/> Home	<input type="checkbox"/> Work	

Section 2 - Site Information									
<b>1. Is there an onsite septic system?</b>									
<input type="checkbox"/> Septic tank within 50 ft. of well		<input type="checkbox"/> Drain field within 100 ft. of well		<input type="checkbox"/> No		<input type="checkbox"/> Yes - Specify Below			
<b>2. Is there surface water within 100 ft. of the well?</b>									
<input type="checkbox"/> Ponds		<input type="checkbox"/> Lagoons		<input type="checkbox"/> Lined irrigation canal		<input type="checkbox"/> No		<input type="checkbox"/> Yes - Specify Below	
<input type="checkbox"/> Unlined irrigation canal		<input type="checkbox"/> River		<input type="checkbox"/> Other					
<b>3. Are there animals/agriculture within 100 ft. of the well?</b>									
<input type="checkbox"/> Orchard/Field		<input type="checkbox"/> Structure/Animals		<input style="width: 90%;" type="text"/>		<input type="checkbox"/> No		<input type="checkbox"/> Yes - Specify Below	
<b>4. Are there large mounds of manure within 100 ft of the well?</b>									
<input type="checkbox"/> Owner		<input type="checkbox"/> Neighbor		<input type="checkbox"/> No		<input type="checkbox"/> Yes - Specify Below			
<b>5. Can you see the condition of the well and wellhead?</b>									
<input type="checkbox"/> Driven Well (sand point)		<input type="checkbox"/> Hand Dug		<input type="checkbox"/> Poorly Maintained		<input type="checkbox"/> No		<input type="checkbox"/> Yes - Specify Below	
<input type="checkbox"/> Broken wellhead seal		<input type="checkbox"/> Holes in casing		<input style="width: 90%;" type="text"/>					
<i>Materials Requested</i>									
<div style="border: 1px solid black; width: 100%;"></div>									



## High Risk Well Assessment

### Section 3 - Survey Questions

6. Do you drink your tap water	<input type="checkbox"/> Tap water	<input type="checkbox"/> Bottled Water	<input type="checkbox"/> Other	<input type="checkbox"/> No	<input type="checkbox"/> Yes
7. What is the main source of your drinking water?	<input type="checkbox"/> Tap water			<input type="checkbox"/> Specify Below	
8. Do you have a system to remove nitrates from your water?	<input type="checkbox"/> Other			<input type="checkbox"/> No	<input type="checkbox"/> Yes - Specify below
Where is it located?	<input type="checkbox"/> Before the house	<input type="checkbox"/> At the sink			
What type is it?	<input type="checkbox"/> R/O	<input type="checkbox"/> Ion			
	<input type="checkbox"/> Ultra-filtration	<input type="checkbox"/> Other			
9. Just a few questions about your household:					
<input type="checkbox"/> # of people	<input type="checkbox"/> Children < Year	<input type="checkbox"/> Vulnerable Health Condition <i>[Script]</i>			
<input type="checkbox"/> W Child bearing age	<input type="checkbox"/> Pregnant	<input type="checkbox"/> Household Income < \$48,000			
10. Has your well been tested within the past 3 years?	<input type="checkbox"/> Coliform	<input type="checkbox"/> Fecal/E. coli	<input type="checkbox"/> Nitrate	<input type="checkbox"/> No	<input type="checkbox"/> Yes - Specify below
			mg/L		
11. Are you familiar with your well?	<input type="checkbox"/> Well log	<input type="checkbox"/> Age of well	<input type="checkbox"/> Depth of well	<input type="checkbox"/> No	<input type="checkbox"/> Yes - Specify below
12. Is your well subject to flooding?				<input type="checkbox"/> No	<input type="checkbox"/> Yes
13. Has your on-site septic system been pumped in the last 5 years?				<input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> N/A
14. Has there been manure or any chemicals applied within 50 ft. of the well?	<input type="checkbox"/> Manure	<input type="checkbox"/> Frequency	<input type="checkbox"/> By who	<input type="checkbox"/> No	<input type="checkbox"/> Yes - Specify below
	<input type="checkbox"/> Chemicals	<input type="checkbox"/> Frequency	<input type="checkbox"/> Type		
15. Have you ever participated in a Yakima County well survey?				<input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Return

## Free Well Water Testing: Phase II (English)

LOWER YAKIMA VALLEY

**GROUNDWATER  
ADVISORY  
COMMITTEE**



**Yakima Health District**  
*Prevention is our business*

*Groundwater Management Area (GWMA):  
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

# Attention **LOWER VALLEY** Residents!



## Does your drinking water come from a private well?

**For a LIMITED TIME ONLY you may be eligible for  
FREE WELL WATER TESTING  
through the  
Lower Yakima Valley Groundwater Advisory Committee (GWAC)**

### What's involved?

- Your drinking water well sampled for nitrates and bacteria for free
- A short survey by a Yakima Health District employee where you can share your concerns and learn about nitrates
- You receive sampling results to help you protect your drinking water and family





### How can I be considered for free testing?

- You must live in the Lower Yakima Valley and
- Obtain your drinking water from a private or shared well

**For more information or to participate, please call  
The Yakima Health District Help Desk**

# 509.249.6508

This sampling is made possible by the GWAC. Your participation will help the committee to better understand and help find some solutions to possible contamination in drinking water wells.  
For more information, please visit: <http://www.yakimacounty.us/gwma/>

## Free Well Water Testing: Phase II (Spanish)

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

**Yakima Health District**  
Prevention is our Business

*Comité Asesor del Área de Manejo de Agua Subterránea (GWMA):  
El propósito de GWMA es reducir la concentración de contaminación por nitrato en el agua subterránea por debajo del estándar estatal para el agua potable.*

# ¡Atención Residentes del VALLE BAJO!



## ¿El agua que usted bebe viene de un pozo privado?

**SÓLO POR TIEMPO LIMITADO** usted puede ser elegible para una **PRUEBA GRATIS DEL AGUA DE SU POZO** a través del **Comité Asesor de Agua Subterránea del Valle Bajo de Yakima (GWAC)**

**¿De qué se trata?** Se evaluará por nitrato y bacteria a pozos de agua potable. Un empleado del Departamento de Salud de Yakima tomará la muestra de su pozo y se le invitará a participar en una encuesta corta. Usted puede consultar sobre cualquier preocupación que tenga del agua de su pozo y los resultados de las prueba estarán disponibles.





## ¿Qué puedo hacer para ser considerado para la prueba gratis?

Para ser considerado, usted debe vivir en el Valle Bajo de Yakima y obtener el agua que bebe de un pozo privado o de un pozo compartido.

Para más información o para participar, llame a la **Línea de información del Departamento de Salud de Yakima**

# 509.249.6508

Estas pruebas son posibles gracias a GWAC. Su participación ayudará al comité a entender mejor y a ayudar a encontrar soluciones a la posible contaminación en los pozos de agua potable. Para más información, visite: <http://www.yakimacounty.us/gwma/>

## **Public Service Announcement: Free Well Water Testing (English)**

### **Public Service Announcement GWAC Lower Yakima Valley Well Sampling**

The Lower Yakima Valley Groundwater Advisory Committee (GWAC) is offering free well water sampling to Lower Yakima valley residents beginning in September.

Drinking water wells will be sampled for nitrate and bacteria. A Yakima Health District employee will be available to discuss any concerns or questions with the survey or sample results with survey participants or the general public. This sampling will help the Committee to better understand and help find solutions to possible contamination in drinking water wells.

For more information and to participate, contact the Yakima Health District Help Desk at: 509-249-6508



## Letter: Invite to Participate in Well Testing (English)

LOWER YAKIMA VALLEY



*Groundwater Management Area (GWMA):*

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

September 2015

Dear Resident:

The Lower Yakima Valley Groundwater Advisory Committee (GWAC) in partnership with the Yakima Health District is offering *free* nitrate and coliform samples for private and shared wells. This is part of an ongoing effort to help residents in the Lower Yakima Valley learn more about the water quality and impact to public health of the area's drinking water.

We are writing to encourage you to participate in our sampling program that should take about 30 minutes. This will be a quick look at conditions surrounding your well that may impact water quality and the health of your family. The samples will show if the water quality may also be a concern to your family's health. The short survey and samples will be completed by an environmental health specialist from the Yakima Health District.

The sampling will be paid for by state funds made available to Yakima County to address areas where there may be high levels of nitrate in drinking water. The survey will help us understand the conditions that exist around the wells and how to best help the residents. It is not our intention to collect personal data for any other use or purpose.

All information collected will be made available to you and will help you make informed decisions about your drinking water and your family's health.

To set up an appointment to participate, please call the Yakima Health District Help Desk at 509-249-6508. The sampling program will begin in September.

The Lower Yakima Valley GWAC is a multiagency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC and this program, please visit: <http://www.yakimacounty.us/gwma/>.

We look forward to working with you.

Sincerely,

J. Rand Elliott, Yakima County Commissioner  
Chairman

The Lower Yakima Valley Groundwater Management Area Advisory Committee



## Letter: Invite to Participate in Well Testing (Spanish)

LOWER YAKIMA VALLEY



*Groundwater Management Area (GWMA):*

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

Septiembre 2015

Estimado residente:

El Comité Asesor del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (GWAC) en asociación con el Distrito de Salud de Yakima está ofreciendo muestras *gratis* de nitrato y bacterias coliformes para los pozos privados y compartidos. Como parte de un esfuerzo continuo para ayudar a los residentes en el Valle Bajo de Yakima a informarse más sobre la calidad y el impacto que tiene el agua para beber del área en la salud pública.

Le escribimos para animarle a que participe en nuestro programa de muestreo que sólo debe durar aproximadamente 30 minutos. La encuesta es un vistazo rápido a las condiciones que rodean su pozo y que pueden afectar la calidad del agua y la salud de su familia. Las muestras mostrarán si la calidad del agua pudiera ser también una preocupación para la salud de su familia. La encuesta corta y las muestras serán tomadas por un especialista en salud ambiental del Distrito de Salud de Yakima.

Las muestras serán pagadas con fondos estatales disponibles para atender áreas del Condado de Yakima donde pudiera haber niveles altos de nitratos en agua para beber. La encuesta nos ayudará a entender las condiciones que existen alrededor de los pozos y la manera de apoyar mejor a los residentes. No es nuestra intención recolectar datos personales para ningún otro uso o propósito.

Toda la información recolectada estará disponible para usted y le ayudará a tomar decisiones informadas acerca de su agua para beber y la salud de su familia.

Para hacer una cita para participar, por favor llame a la línea de ayuda del Distrito de Salud de Yakima al 509-249-6508. El programa de muestreo iniciará este mes. El comité GWAC del Valle Bajo de Yakima es un grupo formado por varias agencias y ciudadanos que coordinan los esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle bajo de Yakima. Para más información acerca de GWAC y de este programa, visite: <http://www.yakimacounty.us/gwma/>.

Esperamos poder trabajar con usted.

Atentamente,

A handwritten signature in black ink, appearing to read "J. Rand Elliott".

J. Rand Elliott, Presidente de Comisionados del Condado de Yakima

Comité Asesor del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima

## Section 6: Results Letters

Every participating household in the assessment received a personalized letter with their assessment results and individualized instructions tailored to their certified lab results.

Educational handouts were included with each results letter (see Section 4).

## Letter 1: [Satisfactory] Nitrate Results and What They Mean



**Groundwater Management Area (GWMA):**

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

May 2015

Parcel number

Name

Address

City State Zip

Dear Resident:

Thank you for participating in the 2014 Lower Yakima Valley Groundwater Management Area (LYV GWMA) High Risk Well Assessment Survey. A certified lab analyzed the water quality samples taken from your home or well during the survey. These samples included an inorganic sample for Nitrate and a bacteriological sample for Coliform.

We enclosed a copy of the lab results for your drinking water.

- \* The Nitrate level detected was fill in here mg/L. These results are normal and well within the acceptable range for nitrate.
- \* The coliform results were satisfactory.

We recommend you continue sampling for nitrate each year, even though your nitrate levels are within an acceptable range (less than 10 mg/L).

We also enclosed fact sheets on Nitrate, Coliform, and websites (links) that you may find helpful. These websites have more information about many drinking water contaminants, Maximum Contaminant Levels, treatment options, as well as proper maintenance for your well. For example:

- \* You may enter your results into the Ohio Watershed Interpretation Tool at (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>) for a detailed explanation of your results for any drinking water contaminant sampled and possible treatment recommendations, or
- \* Go to Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>, for information on private wells, recommended testing, treatment, maintenance, and so on.

### **Why was my well water tested for Nitrate and Coliform?**

The Lower Yakima Valley Groundwater Advisory Committee (GWAC) is a multi-agency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC, please visit: <http://www.yakimacounty.us/gwma/>. Our interest in the study was to inform residents and homeowners served by private or shared wells in the Lower Yakima Valley of the potential health risks associated with their drinking water. We were also interested in gathering more information about the Nitrate level in your drinking water.

### **Can I be of more help?**

Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us) if you know a neighbor or friend in the area who is interested in having their well tested and the survey completed. As part of our effort to evaluate the levels of nitrate in the LYV, we may be looking for permanent ongoing monitoring sites. Please call (509) 574-2300 if you want us to consider your well for part of this effort.

Sincerely,

J. Rand Elliott, Chairman  
Lower Yakima Valley Groundwater Advisory Committee (GWAC)

Enclosures

## Letter 1: [Satisfactory] Nitrate Results and What They Mean (Spanish)



Groundwater Management Area (GWMA):

The purpose of the GWMA is to reduce nitrate contamination concentrations in ground-water below state drinking water standards.

Mayo, 2016

«PARCEL»  
«RESIDENT»  
«ADDRESS»  
«CITY», «STATE» «ZIP»

Estimado residente:

Gracias por su participación en la Encuesta de Evaluación de Pozos de Alto Riesgo del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (LYV GWMA). Un laboratorio certificado analizó la calidad de las muestras de agua que se tomaron de su casa o pozo durante la encuesta. Las muestras se sometieron a una muestra inorgánica para Nitrato y una muestra bacteriológica para Coliforme.

Adjuntamos en esta carta una copia de los resultados de laboratorio de su agua para beber.

- \* El nivel de Nitrato detectado fue de «NITRATE» mg/L. Este resultado es normal y el pozo está dentro de los niveles aceptables de nitrato.

- \* Los resultados para bacteria coliforme fueron satisfactorios.

Aunque los niveles de Nitrato estén dentro de un rango aceptable (menos de 10.0 mg/L), le recomendamos que continúe haciendo pruebas por Nitrato a su pozo cada año.

También adjuntamos hojas con factores acerca del Nitrato, Coliforme y sitios en el internet (enlaces) que pudieran ser útiles. Estos sitios en el internet tienen más información acerca de muchos contaminantes en el agua para beber, Niveles máximos de Contaminación, opciones de tratamiento y también del mantenimiento apropiado de su pozo. Por ejemplo:

- \* Para obtener una explicación detallada de sus resultados para cualquier contaminante al que se le haya echo la prueba a su agua para beber y recomendaciones para un tratamiento posible, usted puede ingresar sus resultados en la Ohio Watershed Interpretation Tool en: <http://ohiowatersheds.osu.edu/know-your-well-water/well-water-interpretation-tool>, o

- \* Para información sobre pozos privados, pruebas que se recomiendan, tratamientos y mantenimiento vaya a Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>.

### ¿Por qué se hicieron pruebas por Nitrato y Coliforme al agua de mi pozo?

El grupo GWAC del Valle Bajo de Yakima es un grupo formado de varias agencias y ciudadanos que está coordinando esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle Bajo de Yakima. Para más información acerca de GWAC, por favor visite: <http://www.yakimacounty.us/gwma/>. Nuestro interés en el estudio fue informar a los residentes y propietarios de casas que usan el agua de pozos privados o compartidos en el Valle Bajo de Yakima de los riesgos potenciales de salud asociados con su agua para beber. También estamos interesados en reunir más información sobre el nivel de Nitrato en su agua para beber.

### ¿Puedo ayudar en algo?

Si, y una vez más, estamos muy agradecidos por la asistencia que ya nos ha brindado. Existen más fondos disponibles para hacer más pruebas y encuestas en casas que usan pozos privados. Nuestro interés es pasar la palabra a más residentes del Valle Bajo de Yakima. Por favor, si conoce a un vecino o amigo en el área que esté interesado en que se le hagan pruebas a su pozo y en hacer la encuesta, llámenos al (509) 574-2300 ó envíe un email a: [FSWebContacts@co.yakima.wa.us](mailto:FSWebContacts@co.yakima.wa.us). Como parte de nuestro esfuerzo para evaluar los niveles de nitrato en el Valle Bajo de Yakima, quizás busquemos lugares permanentes para monitoreo continuo. Por favor, si desea que consideremos su pozo para parte de este esfuerzo llámenos al (509) 574-2300.

Atentamente,

J. Rand Elliott, Presidente  
Comité Asesor de Aguas Subterráneas del Valle Bajo de Yakima (GWAC)

Adjuntos

## Letter 2: [5-9] Nitrate Results and What They Mean



**Groundwater Management Area (GWMA):**

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

May 2015

parcel #  
name  
address  
city state zip

Dear Resident:

Thank you for participating in the 2014 Lower Yakima Valley Groundwater Management Area (LYV GWMA) High Risk Well Assessment Survey. A certified lab analyzed the water quality samples taken from your home or well during the survey. These samples included an inorganic sample for Nitrate and a bacteriological sample for Coliform.

We enclosed a copy of the lab results for your drinking water.

- \* The Nitrate level detected was **fill in here** mg/L. A score between 5 - 9 mg/L shows the nitrate levels are high but still acceptable. However, they may be rising to an unacceptable range.
- \* The bacteria (Total Coliform) results were satisfactory.

Because your Nitrate level is approaching the State Standard of 10.0 mg/L, we recommend you consider sampling your well for Nitrate once every 3 to 6 months.

We also enclosed fact sheets on Nitrate, Coliform, and websites (links) that you may find helpful. These websites have more information about many drinking water contaminants, Maximum Contaminant Levels, treatment options, as well as proper maintenance for your well. For example:

- \* You may enter your results into the Ohio Watershed Interpretation Tool at (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>) for a detailed explanation of your results for any drinking water contaminant sampled and possible treatment recommendations, or
- \* Go to Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>, for information on private wells, recommended testing, treatment, and maintenance.

### **Why was my well water tested for Nitrate and Coliform?**

The Lower Yakima Valley Groundwater Advisory Committee (GWAC) is a multi agency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC, please visit: <http://www.yakimacounty.us/gwma/>. Our interest in the study was to inform residents and homeowners served by private or shared wells in the Lower Yakima Valley of the potential health risks associated with their drinking water. We were also interested in gathering more information about the Nitrate level in your drinking water.

### **Can I be of more help?**

Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us) if you know a neighbor or friend in the area who is interested in having their well tested and the survey completed. As part of our effort to evaluate the levels of nitrate in the LYV, we may be looking for permanent ongoing monitoring sites. Please call (509) 574-2300 if you want us to consider your well for part of this effort.

Sincerely,

J. Rand Elliott, Chairman  
Lower Yakima Valley Groundwater Advisory Committee (GWAC)

Enclosures



## Letter 2: [5-9] Nitrate Results and What They Mean (Spanish)



**Groundwater Management Area (GWMA):**

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

Mayo, 2015

parcel #  
name  
address  
city state zip

Estimado residente:

Gracias por su participación en la Encuesta de Evaluación de Pozos de Alto Riesgo del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (LYV GWMA), 2014. Un laboratorio certificado analizó la calidad de las muestras de agua que se tomaron de su casa o pozo durante la encuesta. Las muestras se sometieron a una muestra inorgánica para Nitrato y una muestra bacteriológica para Coliforme.

Adjuntamos en esta carta una copia de los resultados de laboratorio de su agua para beber.

- \* El nivel de Nitrato detectado fue de **fill in here** mg/L. Un resultado entre 5 y 9 mg/L indica que los niveles de nitrato son altos, pero continúan siendo aceptables. Sin embargo, pudiera ser que los niveles estén en aumento y pudieran llegar a un rango inaceptable.
- \* Los resultados para bacteria (Coliforme Total) fueron Satisfactorios.

Debido a que su nivel de Nitrato se está acercando al Estándar Estatal de 10.0 mg/L, le recomendamos que considere hacer pruebas por Nitrato a su pozo de cada 3 a 6 meses.

También adjuntamos hojas con factores acerca del Nitrato, Coliforme y sitios en el internet (enlaces) que pudieran ser útiles. Estos sitios en el internet tienen más información acerca de muchos contaminantes en el agua para beber, Niveles Máximos de Contaminación, opciones de tratamiento y también del mantenimiento apropiado de su pozo. Por ejemplo:

- \* Para obtener una explicación detallada de sus resultados para cualquier contaminante al que se le haya echo la prueba a su agua para beber y recomendaciones para un tratamiento posible, usted puede ingresar sus resultados en la Ohio Watershed Interpretation Tool en: <http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>), o
- \* Para información sobre pozos privados, pruebas que se recomiendan, tratamientos y mantenimiento vaya a Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>.

### ¿Por qué se hicieron pruebas por Nitrato y Coliforme al agua de mi pozo?

El grupo GWAC del Valle Bajo de Yakima es un grupo formado de varias agencias y ciudadanos que está coordinando esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle Bajo de Yakima. Para más información acerca de GWAC, por favor visite: <http://www.yakimacounty.us/gwma/>. Nuestro interés en el estudio fue informar a los residentes y propietarios de casas que usan el agua de pozos privados o compartidos en el Valle Bajo de Yakima de los riesgos potenciales de salud asociados con su agua para beber. También estamos interesados en reunir más información sobre el nivel de Nitrato en su agua para beber.

### ¿Puedo ayudar en algo?

Si, y una vez más, estamos muy agradecidos por la asistencia que ya nos ha brindado. Existen más fondos disponibles para hacer más pruebas y encuestas en casas que usan pozos privados. Nuestro interés es pasar la palabra a más residentes del Valle Bajo de Yakima. Por favor, si conoce a un vecino o amigo en el área que esté interesado en que se le hagan pruebas a su pozo y en hacer la encuesta, llámenos al (509) 574-2300 ó envíe un email a: [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us). Como parte de nuestro esfuerzo para evaluar los niveles de nitrato en el Valle Bajo de Yakima, quizás busquemos lugares permanentes para monitoreo continuo. Por favor, si desea que consideremos su pozo para parte de este esfuerzo llámenos al (509) 574-2300.


Atentamente,

J. Rand Elliott, Presidente  
Comité Asesor de Aguas Subterráneas del Valle Bajo de Yakima (GWAC)

Adjuntos

## Letter 3: [Ten Plus] Nitrate Results and What They Mean

LOWER YAKIMA VALLEY

GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA):  
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

May 2015

parcel #  
name  
address  
city state zip

Dear Resident:

Thank you for participating in the 2014 Lower Yakima Valley Groundwater Management Area (LYV GWMA) High Risk Well Assessment Survey. A certified lab analyzed the water quality samples taken from your home or well during the survey. These samples included an inorganic sample for Nitrate and a bacteriological sample for Coliform.

We enclosed a copy of the lab results for your drinking water.

- \* The Nitrate level detected was **fill in here** mg/L. A score of 10 mg/L or greater indicates a high unacceptable nitrate level that exceeds the State Standard of 10.0 mg/L.
- \* The bacteria (Total Coliform) results were **fill in here** [satisfactory or unsatisfactory].

Because your Nitrate level is at 10.0 mg/L or above, we recommend you have your well tested every three months for nitrate. You should also consider installing a treatment system to remove excess nitrate or use bottled water for drinking and cooking if a member of your household is:

- \* An infant less than one year of age
- \* Pregnant
- \* May become pregnant or
- \* Has certain blood disorders

We also enclosed fact sheets on Nitrate, Coliform, and websites (links) that you may find helpful. These websites have more information about many drinking water contaminants, Maximum Contaminant Levels, treatment options, as well as proper maintenance for your well. For example:

- \* You may enter your results into the Ohio Watershed Interpretation Tool at (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>) for a detailed explanation of your results for any drinking water contaminant sampled and possible treatment recommendations, or
- \* Go to Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>, for information on private wells, recommended testing, treatment, maintenance, and so on.


**Why was my well water tested for Nitrate and Coliform?**

The Lower Yakima Valley Groundwater Advisory Committee (GWAC) is a multi agency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC, please visit: <http://www.yakimacounty.us/gwma/>. Our interest in the study was to inform residents and homeowners served by private or shared wells in the Lower Yakima Valley of the potential health risks associated with their drinking water. We were also interested in gathering more information about the Nitrate level in your drinking water.

**Can I be of more help?**

Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us) if you know a neighbor or friend in the area who is interested in having their well tested and the survey completed. As part of our effort to evaluate the levels of nitrate in the LYV, we may be looking for permanent ongoing monitoring sites. Please call at (509) 574-2300 if you want us to consider your well for part of this effort.

Sincerely,

  
J. Rand Elliott, Chairman  
Lower Yakima Valley Groundwater Advisory Committee (GWAC)

Enclosures

## Letter 3: [Ten Plus] Nitrate Results and What They Mean (Spanish)

LOWER YAKIMA VALLEY

GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA):  
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Mayo, 2015

parcel #  
name  
address  
city state zip

Estimado residente:

Gracias por su participación en la Encuesta de Evaluación de Pozos de Alto Riesgo del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (LYV GWMA), 2014. Un laboratorio certificado analizó la calidad de las muestras de agua que se tomaron de su casa o pozo durante la encuesta. Las muestras se sometieron a una muestra inorgánica para Nitrato y una muestra bacteriológica para Coliforme.

Adjuntamos en esta carta una copia de los resultados de laboratorio de su agua para beber.

- \* El nivel de Nitrato detectado fue de **fill in here** mg/L. Un resultado mayor de 10 mg/L indica niveles altos no aceptables de nitrato que exceden el estándar Estatal de 10.0 mg/L.
- \* Los resultados para bacteria (Coliforme Total) fueron Satisfactorios.

Debido a que su nivel de Nitrato se encuentra en los 10.0 mg/L o lo excede, le recomendamos que hagan pruebas a su pozo por Nitrato cada 3 meses. También, debería considerar la instalación de un sistema especial para retirar el exceso de nitrato o el uso de agua embotellada para tomar y cocinar si en su hogar vive alguien con las siguientes condiciones:

- \* Infante menor a un año de edad
- \* Embarazo
- \* Pudiera embarazarse
- \* Algún trastorno sanguíneo


También adjuntamos hojas con factores acerca del Nitrato, Coliforme y sitios en el internet (enlaces) que pudieran ser útiles. Estos sitios en el internet tienen más información acerca de muchos contaminantes en el agua para beber, Niveles Máximos de Contaminación, opciones de tratamiento y también del mantenimiento apropiado de su pozo. Por ejemplo:

- \* Para obtener una explicación detallada de sus resultados para cualquier contaminante al que se le haya echo la prueba a su agua para beber y recomendaciones para un tratamiento posible, usted puede ingresar sus resultados en la Ohio Watershed Interpretation Tool en: (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>), o
- \* Para información sobre pozos privados, pruebas que se recomiendan, tratamientos y mantenimiento vaya a Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>.

**¿Por qué se hicieron pruebas por Nitrato y Coliforme al agua de mi pozo?**  
El grupo GWAC del Valle Bajo de Yakima es un grupo formado de varias agencias y ciudadanos que está coordinando esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle Bajo de Yakima. Para más información acerca de GWAC, por favor visite: <http://www.yakimacounty.us/gwma/>. Nuestro interés en el estudio fue informar a los residentes y propietarios de casas que usan el agua de pozos privados o compartidos en el Valle Bajo de Yakima de los riesgos potenciales de salud asociados con su agua para beber. También estamos interesados en reunir más información sobre el nivel de Nitrato en su agua para beber.

**¿Puedo ayudar en algo?**  
Sí, y una vez más, estamos muy agradecidos por la asistencia que ya nos ha brindado. Existen más fondos disponibles para hacer más pruebas y encuestas en casas que usan pozos privados. Nuestro interés es pasar la palabra a más residentes del Valle Bajo de Yakima. Por favor, si conoce a un vecino o amigo en el área que esté interesado en que se le hagan pruebas a su pozo y en hacer la encuesta, llámenos al (509) 574-2300 ó envíe un email a: [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us). Como parte de nuestro esfuerzo para evaluar los niveles de nitrato en el Valle Bajo de Yakima, quizás busquemos lugares permanentes para monitoreo continuo. Por favor, si desea que consideremos su pozo para parte de este esfuerzo llámenos al (509) 574-2300.

Atentamente,



J. Rand Elliott, Presidente  
Comité Asesor de Aguas Subterráneas del Valle Bajo de Yakima (GWAC)

Adjuntos

## Letter 4: Unsatisfactory Coliform Results and What They Mean



### **Groundwater Management Area (GWMA):**

*The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

May 2015

Parcel #  
Name  
Address  
City, State Zip

Dear Resident:

Thank you for participating in the 2014 Lower Yakima Valley Groundwater Management Area (LYV GWMA) High Risk Well Assessment Survey. A certified lab analyzed the water quality samples taken from your home or well during the survey. These samples included an inorganic sample for Nitrate and a bacteriological sample for Coliform.

We enclosed a copy of the lab results for your drinking water.

- \* The Nitrate level detected was **fill in here** mg/L. These results are normal and well within the acceptable range for nitrate.

We recommend you continue sampling for nitrate each year, even though your nitrate levels are within an acceptable range (less than 10 mg/L).

- \* The coliform results were **UNSATISFACTORY**.

Your coliform sample was Unsatisfactory. An Unsatisfactory result means Total Coliform was found in your sample. The presence of this bacteria indicate there is a breach in your well or pipes where dirt is getting into your pipes. We recommend having another coliform sample taken to the lab for analysis.

We also enclosed fact sheets on Nitrate, Coliform, and websites (links) that you may find helpful. These websites have more information about many drinking water contaminants, Maximum Contaminant Levels, treatment options, as well as proper maintenance for your well. For example:

- \* You may enter your results into the Ohio Watershed Interpretation Tool at (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>) for a detailed explanation of your results for any drinking water contaminant sampled and possible treatment recommendations, or
- \* Go to Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>, for information on private wells, recommended testing, treatment, maintenance, and so on.

### **Why was my well water tested for Nitrate and Coliform?**

The Lower Valley GWAC is a multi agency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC, please visit: <http://www.yakimacounty.us/gwma/>. Our interest in the study was to inform residents and homeowners served by private or shared wells in the Lower Yakima Valley of the potential health risks associated with their drinking water. We were also interested in gathering more information about the Nitrate level in your drinking water.

### **Can I be of more help?**

Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us) if you know a neighbor or friend in the area who is interested in having their well tested and the survey completed. As part of our effort to evaluate the levels of nitrate in the LYV, we may be looking for permanent ongoing monitoring sites. Please call (509) 574-2300 if you want us to consider your well for part of this effort.

Sincerely,

J. Rand Elliott, Chairman  
Lower Yakima Valley Groundwater Advisory Committee (GWAC)

enclosure: copy of lab results  
Fact Sheets



## Letter 4: Unsatisfactory Coliform Results and What They Mean (Spanish)



*Groundwater Management Area (GWMA):  
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards*

Mayo, 2015

parcel #  
name  
address  
city state zip

Estimado residente:

Gracias por su participación en la Encuesta de Evaluación de Pozos de Alto Riesgo del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (LYV GWMA), 2014. Un laboratorio certificado analizó la calidad de las muestras de agua que se tomaron de su casa o pozo durante la encuesta. Las muestras se sometieron a una muestra inorgánica para Nitrato y una muestra bacteriológica para Coliforme.

Adjuntamos en esta carta una copia de los resultados de laboratorio de su agua para beber.

- \* El nivel de Nitrato detectado fue de **fill in here** mg/L. Este resultado es normal y el pozo está dentro de los niveles aceptables por nitrato.

Aunque los niveles de Nitrato estén dentro de un rango aceptable (menos de 10.0 mg/L), le recomendamos que continúe haciendo pruebas por Nitrato a su pozo cada año.

- \* Los resultados para bacteria Coliforme fueron INSATISFACTORIOS.

Los resultados para la bacteria coliforme fueron INSATISFACTORIOS. Un resultado Insatisfactorio significa que en su muestra se encontró bacteria Coliforme Total. La presencia de esta bacteria indica que en su pozo o tuberías existe alguna ruptura que permite que entre tierra al sistema. Le recomendamos tome otra muestra para que la analicen en el laboratorio.

También adjuntamos hojas con factores acerca del Nitrato, Coliforme y sitios en el internet (enlaces) que pudieran ser útiles. Estos sitios en el internet tienen más información acerca de muchos contaminantes en el agua para beber, Niveles máximos de Contaminación, opciones de tratamiento y también del mantenimiento apropiado de su pozo. Por ejemplo:

- \* Para obtener una explicación detallada de sus resultados para cualquier contaminante al que se le haya echo la prueba a su agua para beber y recomendaciones para un tratamiento posible, usted puede ingresar sus resultados en la Ohio Watershed Interpretation Tool en: (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool/>), o
- \* Para información sobre pozos privados, pruebas que se recomiendan, tratamientos y mantenimiento vaya a Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>.

### ¿Por qué se hicieron pruebas por Nitrato y Coliforme al agua de mi pozo?

El grupo GWAC del Valle Bajo de Yakima es un grupo formado de varias agencias y ciudadanos que está coordinando esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle Bajo de Yakima. Para más información acerca de GWAC, por favor visite: <http://www.yakimacounty.us/gwma/>. Nuestro interés en el estudio fue informar a los residentes y propietarios de casas que usan el agua de pozos privados o compartidos en el Valle Bajo de Yakima de los riesgos potenciales de salud asociados con su agua para beber. También estamos interesados en reunir más información sobre el nivel de Nitrato en su agua para beber.

### ¿Puedo ayudar en algo?

Si, y una vez más, estamos muy agradecidos por la asistencia que ya nos ha brindado. Existen más fondos disponibles para hacer más pruebas y encuestas en casas que usan pozos privados. Nuestro interés es pasar la palabra a más residentes del Valle Bajo de Yakima. Por favor, si conoce a un vecino o amigo en el área que esté interesado en que se le hagan pruebas a su pozo y en hacer la encuesta, llámenos al (509) 574-2300 ó envíe un email a: [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us). Como parte de nuestro esfuerzo para evaluar los niveles de nitrato en el Valle Bajo de Yakima, quizás busquemos lugares permanentes para monitoreo continuo. Por favor, si desea que consideremos su pozo para parte de este esfuerzo llámenos al (509) 574-2300.

Atentamente,


J. Rand Elliott, Presidente  
Comité Asesor de Aguas Subterráneas del Valle Bajo de Yakima (GWAC)

Adjuntos



## Letter 5: Unsatisfactory Coliform & E. Coli Results and What They Mean

LOWER YAKIMA VALLEY

GROUNDWATER  
ADVISORY  
COMMITTEE

**Groundwater Management Area (GWMA):**  
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

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May 2015

Parcel #  
Name  
Address  
City, State Zip

Dear Resident:

Thank you for participating in the 2014 Lower Yakima Valley Groundwater Management Area (LYV GWMA) High Risk Well Assessment Survey. A certified lab analyzed the water quality samples taken from your home or well during the survey. These samples included an inorganic sample for Nitrate and a bacteriological sample for Coliform.

We enclosed a copy of the lab results for your drinking water.

- \* The Nitrate level detected was **fill in here** mg/L. These results are normal and well within the acceptable range for nitrate.

We recommend you continue sampling for nitrate each year, even though your nitrate levels are within an acceptable range (less than 10 mg/L).

- \* The coliform results were UNSATISFACTORY.

Your coliform sample was Unsatisfactory. An Unsatisfactory result means Total Coliform was found in your sample. In addition, further testing found E. coli (Fecal) present. The presence of this bacteria indicate there is a breach in your well or pipes where dirt is getting into your pipes. We recommend reviewing the enclosed fact sheet for emergency disinfection procedures and having another coliform sample taken to the lab for analysis.

We also enclosed fact sheets on Nitrate, Coliform, and websites (links) that you may find helpful. These websites have more information about many drinking water contaminants, Maximum Contaminant Levels, treatment options, as well as proper maintenance for your well. For example:

- \* You may enter your results into the Ohio Watershed Interpretation Tool at (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>) for a detailed explanation of your results for any drinking water contaminant sampled and possible treatment recommendations, or
- \* Go to Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>, for information on private wells, recommended testing, treatment, maintenance, and so on.


**Why was my well water tested for Nitrate and Coliform?**

The Lower Valley Groundwater Advisory Committee (GWAC) is a multi agency and citizen-based group coordinating efforts to reduce nitrate contamination in drinking water in the Lower Yakima Valley. To learn more about the GWAC, please visit: <http://www.yakimacounty.us/gwma/>. Our interest in the study was to inform residents and homeowners served by private or shared wells in the Lower Yakima Valley of the potential health risks associated with their drinking water. We were also interested in gathering more information about the Nitrate level in your drinking water.

**Can I be of more help?**

Yes, and again we are very grateful for the assistance you have already given us. There is more funding available for doing more tests and surveys on homes served by private wells. Our interest is to get the word out to more residents of the Lower Yakima Valley. Please give us a call at (509) 574-2300 or email us at [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us) if you know a neighbor or friend in the area who is interested in having their well tested and the survey completed. As part of our effort to evaluate the levels of nitrate in the LYV, we may be looking for permanent ongoing monitoring sites. Please call (509) 574-2300 if you want us to consider your well for part of this effort.

Sincerely,




J. Rand Elliott, Chairman  
Lower Yakima Valley Groundwater Advisory Committee (GWAC)

enclosure: copy of lab results  
Fact Sheets

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## Letter 5: Unsatisfactory Coliform & E. Coli Results and What They Mean (Spanish)

LOWER YAKIMA VALLEY



GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA):  
The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards

Mayo, 2015

Parcel #  
Name  
Address  
City, State Zip

Estimado residente:

Gracias por su participación en la Encuesta de Evaluación de Pozos de Alto Riesgo del Área de Manejo de Agua Subterránea del Valle Bajo de Yakima (LYV GWMA), 2014. Un laboratorio certificado analizó la calidad de las muestras de agua que se tomaron de su casa o pozo durante la encuesta. Las muestras se sometieron a una muestra inorgánica para Nitrato y una muestra bacteriológica para Coliforme.

Adjuntamos en esta carta una copia de los resultados de laboratorio de su agua para beber.

- \* El nivel de Nitrato detectado fue de **fill in here** mg/L. Este resultado es normal y el pozo está dentro de los niveles aceptables por nitrato.  
  
Aunque los niveles de Nitrato estén dentro de un rango aceptable (menos de 10.0 mg/L), le recomendamos que continúe haciendo pruebas por Nitrato a su pozo cada año.
- \* Los resultados para bacteria coliforme fueron INSATISFACTORIOS.

Los resultados para bacteria coliforme fueron INSATISFACTORIOS. Un resultado Insatisfactorio significa que en su muestra se encontró bacteria Coliforme Total. Además al evaluarse la muestra más a fondo se encontró E. Coli (Fecal) (Presente / No Presente). La presencia de esta bacteria indica que en su pozo o tuberías existe alguna ruptura que permite que entre tierra al sistema. Le recomendamos que revise la hoja de factores adjunta para que realice los procedimientos de desinfección de emergencia y que tome otra muestra para que la analicen en el laboratorio.


También adjuntamos hojas con factores acerca del Nitrato, Coliforme y sitios en el internet (enlaces) que pudieran ser útiles. Estos sitios en el internet tienen más información acerca de muchos contaminantes en el agua para beber, Niveles máximos de Contaminación, opciones de tratamiento y también del mantenimiento apropiado de su pozo. Por ejemplo:

- \* Para obtener una explicación detallada de sus resultados para cualquier contaminante al que se le haya echo la prueba a su agua para beber y recomendaciones para un tratamiento posible, usted puede ingresar sus resultados en la Ohio Watershed Interpretation Tool en: (<http://ohiowatersheds.osu.edu/well-educated-ohio/well-water-interpretation-tool>).
- \* Para información sobre pozos privados, pruebas que se recomiendan, tratamientos y mantenimiento vaya a Well Owner.org <http://www.wellowner.org/water-quality/water-testing/>.

**¿Por qué se hicieron pruebas por Nitrato y Coliforme al agua de mi pozo?**  
El grupo GWAC del Valle Bajo de Yakima es un grupo formado de varias agencias y ciudadanos que está coordinando esfuerzos para reducir la contaminación por nitrato en el agua para beber en el Valle Bajo de Yakima. Para más información acerca de GWAC, por favor visite: <http://www.yakimacounty.us/gwma/>. Nuestro interés en el estudio fue informar a los residentes y propietarios de casas que usan el agua de pozos privados o compartidos en el Valle Bajo de Yakima de los riesgos potenciales de salud asociados con su agua para beber. También estamos interesados en reunir más información sobre el nivel de Nitrato en su agua para beber.

**Puedo ayudar en algo?**  
Sí, y una vez más, estamos muy agradecidos por la asistencia que ya nos ha brindado. Existen más fondos disponibles para hacer más pruebas y encuestas en casas que usan pozos privados. Nuestro interés es pasar la palabra a más residentes del Valle Bajo de Yakima. Por favor, si conoce a un vecino o amigo en el área que esté interesado en que se le hagan pruebas a su pozo y en hacer la encuesta, llámenos al (509) 574-2300 ó envíe un email a: [PSWebContacts@co.yakima.wa.us](mailto:PSWebContacts@co.yakima.wa.us). Como parte de nuestro esfuerzo para evaluar los niveles de nitrato en el Valle Bajo de Yakima, quizás busquemos lugares permanentes para monitoreo continuo. Por favor, si desea que consideremos su pozo para parte de este esfuerzo llámenos al (509) 574-2300.

Atentamente,



J. Rand Elliott, Presidente  
Comité Asesor de Aguas Subterráneas del Valle Bajo de Yakima (GWAC)

Adjuntos

## Section 7: GWAC Presentations

Powerpoint presentations were created for GWAC representatives to share with their constituents. The presentations were also posted to the web.

## GWMA Mission Presentation

[http://www.yakimaco.us/GWMA/documents/GWAC%20Presentation Basic%20Talking%20Points GWAC%20APPROVED 2013 1219.pdf](http://www.yakimaco.us/GWMA/documents/GWAC%20Presentation%20Basic%20Talking%20Points%20GWAC%20APPROVED%202013%201219.pdf)

### GWMA Mission

#### Groundwater Management Area (GWMA):

The goal of the Lower Yakima Valley GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards.

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA)

### Background

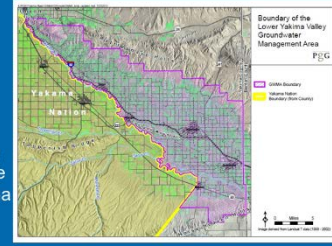
- In 2011, the Lower Yakima Valley Groundwater Management Area (GWMA) was formed to address nitrate contamination in groundwater.
- The GWMA is a response to the elevated nitrate levels found in the Lower Yakima Valley which exceed the state standard of 10.0 mg/L.
- Private drinking water wells with nitrate levels higher than the state standard, pose a greater health risk to those individuals susceptible to elevated nitrate in their drinking water.

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA)

### GWMA Boundaries

The GWMA boundaries extend west from Union Gap east to County Line Road, minus the Yakama Nation.



The GWMA encompasses 175172.66 acres or 273.7 square miles.

<http://www.yakimacounty.us/1617/Ground-Water-Management-Area>

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA)

### What the GWMA Intends to Do:

Yakima County requested Dept of Ecology to recognize the GWMA and provide assistance for helping reduce the nitrate level in the groundwater. Objectives include:

- Data Collection, Monitoring and Analysis.
- Public Education and Outreach.
- Problem Identification.
- Potential Measures or Practices for Reducing Groundwater Contamination.

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA)

### GWMA GroundWater Advisory Committee

- The Lower Yakima Valley Groundwater Management Area Committee (GWAC) is responsible for developing the (GWMA) plan.
- The GWAC is a multi-agency and citizen-based group with 22 primary members and alternates.
- To learn about their progress or to attend a meeting, please visit: <http://www.yakimacounty.us/agendacenter>

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA)

### GWMA GroundWater Advisory Committee Membership

Commissioner Rand Elliott,  
Yakima County Board of Commissioners

Vern Redifer, P.E. (alternate),  
Yakima County Public Services

Lower Yakima Valley **GWAC** Members and Alternates

<http://www.yakimacounty.us/541/Ground-Water-Management-Area>

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater Management Area (GWMA)

## GWMA Working Groups:

<http://yakimacounty.us/583/Working-Groups>

### Livestock / CAFO

Chair: David Bowen

### Irrigated Agriculture

Chair: Dr. Troy Peters

### Residential, Commercial, Industrial, Municipal

Chair: Dan DeGroot

### Data Collection, Characterization, Monitoring

Chair: Melanie Redding

### Regulatory Framework

Chair: Jean Mendoza

### Education & Public Outreach

Chair: Lisa Freund

### Funding

Chair: Pending



Groundwater Management Area (GWMA)

## GWAC Working Groups

Working groups were convened to provide focused information and plans for the objectives identified in the request.

The GWMA website offers reference material and guides users to agency partners who have additional information.

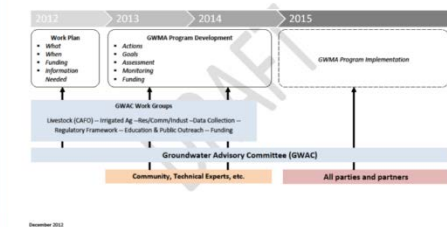
The working group meetings are posted on the website and are open to the public just like the committee meetings.



Groundwater Management Area (GWMA)

## GWMA Timeline

Groundwater Management Area (GWMA) Timeline and Schedule of Activities and Input



Groundwater Management Area (GWMA)

## Citizen-Based Pollution Prevention

Pollution prevention will be a guiding principle for all work.

**A coordinated effort to address groundwater contamination in the Yakima Basin.**

Seeks credibility with the general public, the farming community, stakeholders, and special interest groups.

**Multiple approaches including education, technical assistance and accountability strategies.**



Groundwater Management Area (GWMA)

## How To Get It Done?

Identify the primary sources of nitrate contamination using scientific data.

**Identify or develop practices that will minimize nitrate contamination of groundwater**

Develop a plan that recommends strategies for implementing improved practices

**Provide appropriate education and outreach on health risks and how to prevent exposure.**



Groundwater Management Area (GWMA)

## How To Get It Done?

**Citizen surveys.**

**Multi-language media outreach.**

**Health community education, awareness and participation.**

**Partnerships with Agricultural businesses and employers, farming community, special interest groups, medical organizations, and other interested stakeholders.**



Groundwater Management Area (GWMA)



## Summary

The goal of the LYV GWMA is the reduction of nitrate levels in the groundwater to below state standards.

Previous studies conducted by EPA and others, have shown a significant problem with elevated nitrate in the shallow aquifer.

Nitrate is an Acute contaminant which can affect those residents at higher risk from nitrate rather quickly, and from a single exposure.

The biggest threat is to the private wells, that are shallow, poorly constructed, poorly located, and rarely tested.

Surveys within the LYV with residents may continue as a tool for providing outreach to residents.



## Contact

### Who do I report suspected nitrate contamination to?

Yakima County Health District Communicable Disease Report  
Line: 509-249-6521

For information about water quality, treatment, options, call the  
Environmental Health help desk at 509-249-6508

On the Yakama Nation  
Indian Health Services -Environmental Health  
Shawn Blackshear 509-865-1776

[Shawn.blackshear@ihs.gov](mailto:Shawn.blackshear@ihs.gov)

For more information on the Lower Yakima Valley Groundwater Management Area or the  
Groundwater Advisory Committee, please visit: <http://www.yakimacounty.us/541/Ground-Water-Management-Area>

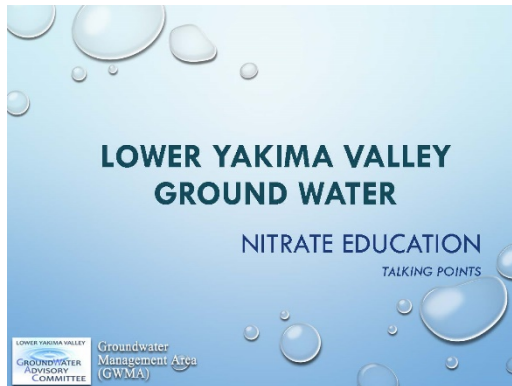
Thank you for your interest.





## Nitrate Education Presentation

[http://www.yakimaco.us/GWMA/documents/Lower\\_Yakima\\_Valley\\_Ground\\_Water\\_Nitrate\\_Education.pdf](http://www.yakimaco.us/GWMA/documents/Lower_Yakima_Valley_Ground_Water_Nitrate_Education.pdf)



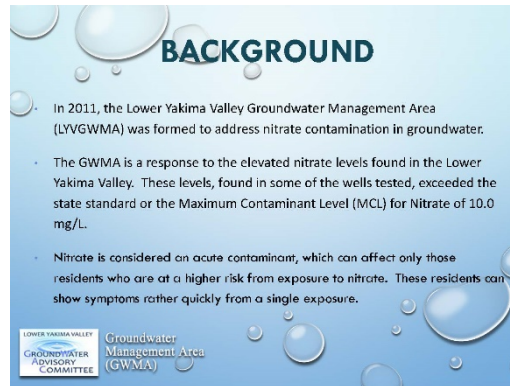
**LOWER YAKIMA VALLEY  
GROUND WATER**

**NITRATE EDUCATION**

TALKING POINTS

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater  
Management Area  
(GWMA)

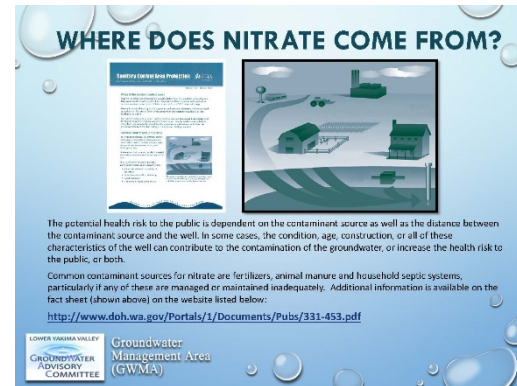


**BACKGROUND**

- In 2011, the Lower Yakima Valley Groundwater Management Area (LYVGWMA) was formed to address nitrate contamination in groundwater.
- The GWMA is a response to the elevated nitrate levels found in the Lower Yakima Valley. These levels, found in some of the wells tested, exceeded the state standard or the Maximum Contaminant Level (MCL) for Nitrate of 10.0 mg/L.
- Nitrate is considered an acute contaminant, which can affect only those residents who are at a higher risk from exposure to nitrate. These residents can show symptoms rather quickly from a single exposure.

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater  
Management Area  
(GWMA)



**WHERE DOES NITRATE COME FROM?**

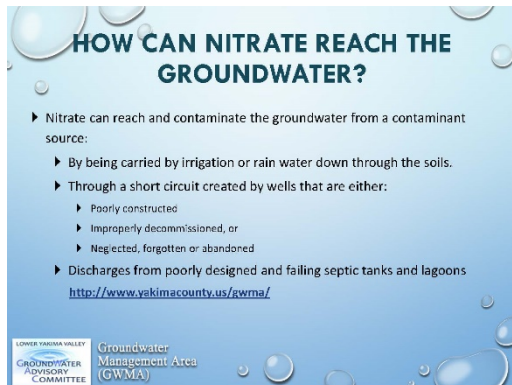
**THE POTENTIAL HEALTH RISK TO THE PUBLIC IS DEPENDENT ON THE CONTAMINANT SOURCE AS WELL AS THE DISTANCE BETWEEN THE CONTAMINANT SOURCE AND THE WELL. IN SOME CASES, THE CONDITION, AGE, CONSTRUCTION, OR ALL OF THESE CHARACTERISTICS OF THE WELL CAN CONTRIBUTE TO THE CONTAMINATION OF THE GROUNDWATER, OR INCREASE THE HEALTH RISK TO THE PUBLIC, OR BOTH.**

Common contaminant sources for nitrate are fertilizers, animal manure and household septic systems, particularly if any of these are managed or maintained inadequately. Additional information is available on the fact sheet (shown above) on the website listed below:

<http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-453.pdf>

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater  
Management Area  
(GWMA)



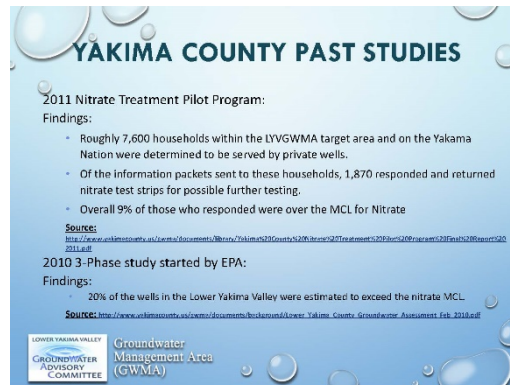
**HOW CAN NITRATE REACH THE  
GROUNDWATER?**

- Nitrate can reach and contaminate the groundwater from a contaminant source:
  - By being carried by irrigation or rain water down through the soils.
  - Through a short circuit created by wells that are either:
    - Poorly constructed
    - Improperly decommissioned, or
    - Neglected, forgotten or abandoned
  - Discharges from poorly designed and failing septic tanks and lagoons

<http://www.yakimacounty.us/gwma/>

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater  
Management Area  
(GWMA)



**YAKIMA COUNTY PAST STUDIES**

2011 Nitrate Treatment Pilot Program:

Findings:

- Roughly 7,600 households within the LYVGWMA target area and on the Yakima Nation were determined to be served by private wells.
- Of the information packets sent to these households, 1,870 responded and returned nitrate test strips for possible further testing.
- Overall 9% of those who responded were over the MCL for Nitrate

**SOURCE:** <http://www.yakimacounty.us/assets/documents/Reports/Yakima%20County%20Nitrate%20Treatment%20Pilot%20Program%20Final%20Report%202011.pdf>

2010 3-Phase study started by EPA:

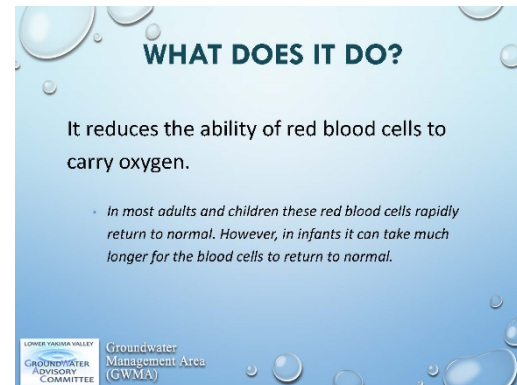
Findings:

- 20% of the wells in the Lower Yakima Valley were estimated to exceed the nitrate MCL.

**SOURCE:** [http://www.yakimacounty.us/assets/documents/Background/Lower\\_Yakima\\_Valley\\_Groundwater\\_Assessment\\_Feb\\_2010.pdf](http://www.yakimacounty.us/assets/documents/Background/Lower_Yakima_Valley_Groundwater_Assessment_Feb_2010.pdf)

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater  
Management Area  
(GWMA)



**WHAT DOES IT DO?**

It reduces the ability of red blood cells to carry oxygen.

- In most adults and children these red blood cells rapidly return to normal. However, in infants it can take much longer for the blood cells to return to normal.

LOWER YAKIMA VALLEY  
GROUNDWATER  
ADVISORY  
COMMITTEE

Groundwater  
Management Area  
(GWMA)

## WHO IS AT RISK?

Those considered at high risk from exposure to elevated or high levels of nitrate include:

- Children less than 1-yr of age,
- Pregnant women,
- Women who may become pregnant,
- Individuals with certain blood disorders, such as
  - Lack of enzyme that converts affected red blood cells back to normal, or
  - Low stomach acids.

Infants who drink water with high levels of nitrate (or eat foods made with nitrate-contaminated water) may develop a serious health condition due to the lack of oxygen.

This condition if left untreated may cause death.

This condition is known as Methemoglobinemia or "blue baby syndrome."



Groundwater Management Area (GWMA)

## "BLUE BABY SYNDROME"

Methemoglobinemia

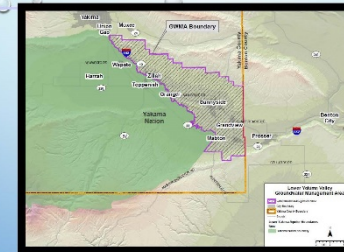
### MODERATE TO SERIOUS

- Lethargic
- Mental Status Changes
- Respiratory Distress
- Blue color, especially around mouth, lips & nail beds
- Rapid Heart Rate
- Chocolate Colored Blood
- Shock-Seizures-Coma-Death



Groundwater Management Area (GWMA)

## GWMA BOUNDARY



Groundwater Management Area (GWMA)

## TESTING



Link to the GWMA Certified Laboratory List:  
<http://yakimacounty.us/GWMA/documents/Updated%20Certified%20Laboratories%207-23-13.pdf>

### DOES THE STATE REGULATE NITRATE IN DRINKING WATER?

The safe drinking water standard for nitrate is 10 milligrams per liter (mg/L) or MCL.

#### Yes:

State and federally regulated public water systems.  
 Includes routine sampling and install treatment if necessary.

#### No:

Private or shared wells, which includes the farm exempt wells.

Not required to sample or install treatment.

Property owners are responsible for ensuring safe drinking water is provided to their homes.



Groundwater Management Area (GWMA)

## AVAILABLE RESOURCES

### LOWER YAKIMA VALLEY GROUNDWATER MANAGEMENT AREA (LYVGWMA)

- The purpose of the LYVGWMA is to reduce the nitrate contamination concentrations in groundwater below the state drinking water standards
- Current standard is a Maximum Contaminant Level of 10.0 mg/L
- The Groundwater Advisory Committee provides a website where the public can:
  - Observe the committee's progress,
  - View the documents, studies, and presentations approved by the committee,
  - Obtain nitrate education materials and private well owners' guidance (technical assistance),
  - Find out about upcoming meetings, activities and public events and how to get involved.
- <http://www.yakimacounty.us/gwma/>



Groundwater Management Area (GWMA)

## AVAILABLE RESOURCES

Education and outreach materials developed during the Nitrate Treatment Program:

<http://www.yakimacounty.us/nitrateprogram/english/default.htm>

#### Materials identify:

- Vulnerable population – Those most at risk from health effects associated with elevated nitrate.
- State certified water quality sampling labs – Coliform (Bacteria) and nitrate.
- Technical assistance for private well owners.



Groundwater Management Area (GWMA)



## Section 8: Promotional Billboards

### Private Well Users Test Your Water



Private Well Users  
Test Your Water  
Thank You

For More Information please call 509-574-2300





## Private Well Users Test Your Water (Spanish)

